June 26–July 2 1987 Vol 6 No 25 60p

POPULAR Computing WEEKLY

Acorn launches RISC machine

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ARM: Acorn RISC Machine

The Mega STs

Atari's souped-up STs reviewed on page 12

Hall of Fame

Faery Tale on the Amiga see page 41

Win a day out at Silverstone

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22 Listings This week we've got Panel Copy on the Memotech – print out panel details from the built-in monitor – and Zoom on the QL, a memory manipulator. Also, part three of Khandal II for CPC owners, a sound effects creator on the Commodore 64 and Screen Mover on the Spectrum. Plus short routines in Bytes and Pieces.

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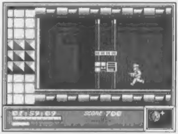
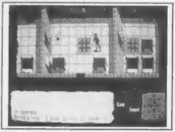


Top: Acorn's ARM Risc micro. Above: Screen dump produced with Rockfort's Disciple interface for Spectrum. Below: screen from Faery Tale



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LETTERS

Solve those alignment blues

May I offer the following advice to Commodore 1541 disc drive users, who have experienced alignment problems and used Evesham Micros' Alignment disc.

When using this program to ensure a 'permanent' fix I devised the following modification on both my regular 1541 and the drive in my SX64.

At all times using considerable care I dismantled the drive and completely removed the stepper motor from the chassis (or as far as possible with the SX64). The position of the motor was scribed on the underside, alongside one of the securing arms. The steel drive had been released from the drive pulley, on top of the motor. The motor can then be removed from the chassis and the wire loom carefully unthreaded, leaving just the motor and attached wire!

The next step entailed releasing and removing completely the grub screw from within the motor pulley, the same hole into which the steel band was secured.

Note, liberal amounts of thread locking adhesive have been used throughout original assembly.

Once the grub screw is removed, by using a 1·5mm watchmakers screw driver, the modification can be made.

Again using extreme care, secure the motor and prevent the drive shaft from rotating – this is very important. By using a drill bit much smaller than the hole and a low powered drill or even a hand drill a small dimple is drilled in the motor shaft, down the threaded hole without damage to the threads or reassembly will be impossible!

If owners do not have the necessary facilities or skills with which to carry out the operation an approach to local tradesmen such as piano tuners, watchmakers or instrument technicians could be made.

Once the dimple is made, the disc drive can be reassembled in reverse order, using thread locking adhesive as required, apart from motor mounting screws since they need to be free for the subsequent adjustment procedure. Take great care at all times but especially when replacing the steel drive band. Do not twist. Note the tension spring, release this to ease replacement of steel band.

Make absolutely sure that no swarf remains in the hole or enters the disc drive!

Keith L Moody
Scunthorpe

The caring company

All too often I read in these columns about the appalling service customers receive from some mail order companies. I think it's about time we heard more about those companies who care about their customers.

After reading about Spectrum Adventurer in Tony Bridge's column, I ordered a copy of its tape magazine which promptly arrived by return of post.

I then ordered its adventure *Castle Thade Revisited*. I received a letter from the company saying it was out of stock, and that a new version was being written. They offered to return my cheque if I didn't want to wait for it.

A week later I received another letter stating that the programmer was ill and that the new version would be delayed. Again I was offered the opportunity of having my cheque returned.

When the adventure finally arrived (last week) it was accompanied by a complimentary copy of its tape magazine and an apology for such a delay.

Well done Spectrum Adventurer.

Peter Watson
Glasgow

Looking for a robot

About two years ago a series of robots which you built yourself from a kit (for around £20) were available.

If they still are where can I obtain them from and how much do they cost?

Stephen Chandler
Canvey Island, Essex

The offer for the entire kit is no longer available. However, you should be able to put the kit together piecemeal by buying the components separately from local shops.

The search for an assembler

I would like to know where I can get hold of a two pass assembler for the Commodore 64. I've tried everywhere, but I can only find the normal type.

Please can you tell me where I can purchase one and put hundreds of users out of their misery.

[illegible] Fance
Chigwell, Essex

Supersoft is still selling its Mikro two pass assembler for the 64 at £57.50. You can contact the company on 01-861 1166 for details.

Incidentally, our apologies if we've got your name wrong – your signature was less than legible.

Down with sexism

Another attempt to introduce overt sexism in computing comes in the form of Palace Software's insulting advert on the back of *Popular*, June 5.

Does Palace really think that using an image of a semi-naked woman apparently worshipping a mass murderer is going to boost sales of *Barbarian*?

This advert is insulting in two ways.

a) The assumption that the grey matter of its potential consumers is minuscule and solely located between their legs.

b) That its market is homogenously male.

I was tempted to furtively ask the newsagent to put it in a brown paper bag and creep out looking out for the heavy hand of the Obscene Publications squad as I hurried up the high street feeling distinctly embarassed.

I have been trying lately to convince my partner and her daughter that computers are not discerning about the gender of the user. This sort of thing devalues this assertion.

I am also horrified at the number of games that promote and glorify murder as a sport. War, murder and maiming are not a game. In real life you can't pause if you can't escape, you only get one life in the real thing and can't play again if your aggression fails to achieve the end that you desire.

Imagine an alien life form surveying the planet. They would find a proportion of the young male population not only refighting old wars (war games), but actively "practising" the welcome for visitors of another intelligence, with lasers, nuclear war-heads, and apparently suicidal desire to eradicate any visitors from elsewhere.

Please, can we try and shake off the image of computing (especially for pleasure) is a pastime for males? To continue this falsehood is to alienate the majority of the population. The future of computing lies in widening the user base to diversify the uses of computers.

Andy Smith
London NW5

Hear, hear. Ed.

Up with Memotech

When the Memotech MTX series of microcomputers were first released in late 1983, it was hoped that it would rival the BBC B and ZX Spectrum. The Memotech offered an unprecedented hard and software specification, and it had an imaginative design. Memotech also had the foresight to include CP/M 2.2 as an upgrade option, long before Amstrad and CP/M caught the imagination of home users.

The Memotech's Porsche-like design (*Are you sure about this? Ed*), was matched by its fast and well structured operating system. Not only was the Basic bug free, and powerful, it incorporated many concepts which only came to the forefront when Apple launched the Mac.

Yes, the original Memotech machines included windowing and many other graphic features like 16 colour, high resolution graphics, 32 hardware sprites, logo graphic commands, all controllable from within Basic, without resorting to poking and peeking as on the C64.

The Memotech also included a revolutionary concept of NODDY, a text orientated language, ideally suited for data-basing etc. Memotech didn't stop there, it included a Z80 line assembler, which computer reviewers had been looking for. Also to include its appeal to the experienced Z80 programmers

It included Front Panel, a fully blown Monitor/disassembler. All this interfaced with Basic and with the Disc system.

Remember, all this was available in 1983. Only now are other computer owners able to get a Z80 assembler with comparable power, but at a price (£39.95) yes, *Devpac 2*. (You can even run this under the CP/M environment on the Memotech). The strange coincidence is that, you can buy a MTX 512 series 1, for the same price as *Devpac 2* (available from UK Home Computers on 0793 695034). Strange that it's taken four years to equal, possibly improve on the Memotech range.

A F Wilson
Whitehaven, Cumbria

Beware of repair company

I just thought I'd write to warn your readers about a repair company. The Z80 in my Spectrum 128 (the proper black one) was faulty so I decided to send it to The Specialist Computer Repair Centre, as advertised in *Sinclair User*, because it offered a 24 hour return service.

It also offered £33 of free software, so I sent it to them on that Tuesday. After many phone calls, I received my computer 18 days later. My 128 was fine, but the free software never arrived.

I have phoned twice, and written a letter of complaint, but I've heard nothing, and don't expect to.

T Allen
Dartford, Kent

PS Thanks a lot to Alan Sugar for bringing out a stand-alone add-on disc drive for all us 128 and Plus 2 owners. It's nice to know he cares for us as much as he cares for Amstrad CPC 664 owners.

Every computer has its faults

I have noticed once again that your letters page is becoming a 'my computer is better than yours' forum.

Every computer has its good and bad points, ranging from sound to the availability and price of its software. No matter which computer you own, someone else's will always seem better.

I own a Vic 20 (remember them?), a Spectrum 128 Plus 2, and an Atari 800XL. I enjoy using them all as each has its good points.

Do people who criticise other computers that they do not own do it to justify to themselves their own purchase?

Finally, a word of praise to two mail order firms for their speedy service and friendly telephone manner. They are Post Haste of Hampshire and Strategic Plus of Middlesex. To both of these firms I say a big thank you.

T Vanns
Watford

Whose Who's Who is whose?

I was surprised to see the title of the Centaur Communications' publication *Who's Who In Computing* above an article about the *Computer Users Yearbook Who's Who* (News Desk, May 22).

Who's Who In Computing is a major computer industry title recently acquired by Centaur. It will be published again this September and, unlike the *Computer Users Yearbook Who's Who*, our publication will be a detailed directory of major UK computer sites, their equipment, the people, applications, and principal business activity plus a comprehensive directory of computer products and services including hardware, software, peripherals, bureauxs, maintenance, recruitment and financial services.

So although we do like to see the name of our title in print we would prefer not to see [illegible] confused with another publication.

Frank Rocco
Publisher/Directories Division
Centaur Communications

ST database offer

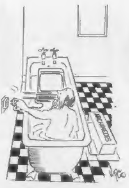
I would like to tell your readers about a new user database I have set up for Atari ST owners. Called *ST Register* (surprise, surprise!) the aim is to put ST owners in touch with other ST owners in their area or perhaps with the same interests.

The way the database works is this: users send me their address, details of their system (what model, printer, etc), and their computing interests with the machine. I will put all this information into a database which users can receive a dump of if they send me a blank disc and a stamp to cover return postage.

Owners can receive the list on a brand new disc if they send me £2.50 instead. If owners have any queries, they can contact me on 0467 42536, preferably during the evening.

This system works best if as many people as possible take the time to register with me since it will enable owners to find others with the same interests, or who will be able to help with some programming or software problem. The register has been running for about a month now and already a wide range of owners have written to me. Why not join them?

William Hern
Aberdeen



"Hmm—seems a bit risky!"

Correction

A small number of errors crept into the Popular Election listing (June [illegible] onwards). The corrected lines are shown below.

```
270 LET e(party)=INT (RND*5+1): LET c(p
arty)=INT (RND*3+1)

540 LET f=f+1: IF f<6 THEN GO [illegible] 530

640 LET f=f+1: IF f<4 THEN GO [illegible] 630
740 LET f=f+1: IF f<5 THEN GO TO 730

840 LET f=f+1: IF f<6 THEN GO TO 830

1120 GO SUB 8000+(b(party)*10): INK 0: P
APER 7

1320 IF INKEY$="" THEN GO TO 1320: BEEP
.1,3

3565 PRINT AT 9,6;"All NHS  - ";l(1);"%"
;AT 10,6;"Large NHS- ";l(2);"%";AT 11,6;
"Modrt NHS- ";l(3);"%";AT 12,6;"Cut NHS
 - ";l(4);"%";AT 13,6;"No NHS   - ";l(5)
;"%"
```

Bishop under attack

In Game One of our readers' versus *Colossus* chess tournament, the readers have chosen retreat, moving their queen back to b7. *Colossus* has continued its aggressive play by attacking the bishop on d6, possibly hoping for a passed pawn late on (see diagram for details).

The next move

How would you contain *Colossus* at this point?

Send your suggested readers' move to *either* Inter-Mediates (*Popular* Chess), Freepost, Sawbridgeworth, Herts CM21 9YA (no stamp needed), *or Popular* Chess, Unit [illegible], The Maltings, Sawbridgeworth, Herts CM21 0PG (with a stamp). Please note that Freepost is slower than the normal service, so if you want to save stamp money, get your entry off promptly.

Only one vote per person please, and [illegible] entries must reach either address by Wednesday, July 1.

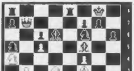
The move which gets the most votes will [illegible] entered into the game. Results and *Colossus*'s response will be published in two weeks time.

Next week, we return to Game Two, where the Readers are playing white.

Game One

The moves so far:

1	Pe2-e4	Pc7-c5
2	Ng1-f3	Nb8-c6
3	Bf1-c4	Ng8-f6
4	Nf3-g5	Pd7-d5
5	Pe4xd5	Nc6-a5
6	Bc4-b5+	Pc7-c6
7	Pd5xc6	Pb7xc6
8	Bb5-e2	Ph7-h6
9	Ng5-f3	Pe5-e4
10	Nf3-e5	Bf8-d6
11	Pd2-d4	Pe4-d3 (en passant)
12	Ne5xd3	Qd8-c7
13	Nb1-c3	Ke8-g8 o-o
14	Pf2-f4	Qc7-b6
15	Nc3-a4	Qb6-d4
16	Pc2-c3	Qd4-d5
17	Ke1-g1 (o-o)	Rf8-e8
18	Be2-f3	Qd5-b5
19	Pb2-b3	Bc8-f5
20	Pc3-c4	Qb5-b7
21	Pc4-c5	?



Acorn RISCs it

ACORN last week launched its new range of 32-bit RISC-based machines, called the *Archimedes* series, proclaiming them the fastest microcomputers [illegible] the world.

The machines are split into two series of two micros each. The 410 and 440 have more memory and are more easily expandable, while the 305 and 310 are cheaper with fewer options.

The range also includes *SpringBoard*, a plug-in board for IBM PCs and compatibles, which contains the RISC computer found in the other *Archimedes* machines.

Although all machines in the range run [illegible] new version of BBC Basic - Basic V, Acorn boss Brian Long made it clear that there will be compatibility with 'legal' software written for the Master Compact.

As widely predicted last month, the BBC has adopted the 300 series as its new micro, although Acorn stressed that the existing BBC Master and Master Compact machines will continue to be sold.

The new machines have a bundled WIMP environment, as well as BBC Basic V. This new standard operating system is called Arthur, which Acorn claims offers a "high degree of familiarity to users with BBC Micro experience".

There will be support for a number of languages - C, ISO-Pascal, Fortran-77, Lisp, Prolog and Comal.

Acorn announced a long list of applications software under development both by Acorn itself and third-party developers. Many of the names are stalwarts of the BBC range including Computer Concepts, Clares and Beebug.

Leading the field in forthcoming applications are enhanced versions of the View family, *Wordwise*, and a host of educational products. Few of them, however, will be available before October.

So far two 300 series machines have been announced with prices starting at £940 for a 512K model with a single 3½ inch floppy disc drive of 1Mb unformatted capacity. The price does not include a monitor.

Archimedes

Price	Model	305	310	410	440
Box		£940	£1029	£1645	£2704
Mono		£998	£1088	£1704	£2763
Colour		£1175	£1264	£1881	£2940

The two 400 series machines, the 410 and 440, are aimed more at the business user.

"The range of standard languages and operating environments supported by the machines has already created a significant level of interest from users of computer-aided design, desktop publishing and expert systems," said an Acorn spokesman.

The 410 has 1Mb Ram, a 3½ inch 1Mb unformatted floppy disc drive, [illegible] hardware floating point unit option, a co-processor bus, a hard disc controller, a four-socket back plane and 512K of Rom.

What is RISC?

RISC stands for Reduced Instruction Set Computer - as opposed to Complex Instruction Set Computer. The main advantage of RISC-based machines over CISC-based units is their speed.

The RISC instruction set is simpler, omitting many of the complex instructions and addressing modes of CISC units.

This makes them easier to develop, cheaper to produce, and able to hold large amounts of memory.

The chip [illegible] the *Archimedes* machines - ARM, the Acorn RISC Machine - can operate at 4 mips (millions of instructions per second).

The announcement is an important one for the micro industry in general, and Acorn in particular, since *Archimedes* [illegible] the first commercially-available RISC-based microcomputer in the world.

Expanding the power of the ARM

Acorn is keen to point out the expandability and emulation capabilities of *Archimedes*. All machines can be expanded by using MS-DOS, I/O, Midi and Rom peripheral modules, and there are Ram upgrade kits from ·5Mb up to 1Mb for the 305, and from 1Mb to 4Mb for the 410.

Acorn plans to release further podules next year, including an Ethernet network card and a SCSI card. Third party podules due for release include [illegible] modem, video frame grabber, an A to [illegible] interface and an IEEE 488 card.

All the machines can be used as emulators of the original BBC Micro 6502 chip, with the bundled 6502 emulation software, and the Intel 8088 chip, with the MS-DOS peripheral module. The MS-DOS capability may prove an important factor, since it can run MS-DOS programs with the processing power of the ARM.

But a major contribution to this aspect of Acorn's new system is the PC application card - *SpringBoard*.

SpringBoard executes machine code four times faster than a Dec VAX 11/750, and is a 32-bit computer in its own right, so concurrent operations with the host PC can be carried out.

SpringBoard has up to 4Mb Ram and can run at up to 4 mips. It will cost about £1000 for a 1Mb version, or about £2000 for the 4Mb version.

The entire *Archimedes* range will be available directly through "60 or 70 specialist dealers", according to Long.

Long wouldn't be drawn on sales targets, but revealed that Acorn is expecting ARM itself to have a market life of between 10 and 14 years.

The BBC series, the 300, was available in limited quantities from last week, with large-scale shipments beginning in September.

The 440 is due for delivery in November, while the 410 should ship early in the New Year.

Amstrad gives City jitters as PC ships early

AMSTRAD has brought forward its UK launch date for the PC1640, and will be previewing the EGA versions of the machine at the PC User Show next week.

Limited numbers of the new PC will be shipping in August, and volume delivery should begin in September.

The move sparked off speculation among City observers that Amstrad's future is not as rosy as it appeared.

A number of analysts, including Chase Manhattan Securities and Phillips and Drew, are said to have revised their 1987/88 forecasts for Amstrad downwards.

Chase cut its profits forecast from £214m to £180m, and Phillips and Drew cut its from £175m to £150m.

It was a bad week for Amstrad altogether. The forecast revisions were provoked by the PC1640 announcement, which was in turn seen as confirmation of market research reports that Amstrad PC sales figures were only half of last September's 70,000 target.

Phillips and Drew, for one, is reported to be unsure about future prospects for the PC1512, saying that the rescheduling of the PC1640 launch will deter sales of the earlier models.

The net result of all this was a 20 per cent drop in Amstrad's share price last week.

In making the announcement, Amstrad sales and marketing chief Malcolm Miller added a vigorous denial that the company was about to drop the PC1512.

"There has been persistent rumour that we will be dropping the PC1512, but I can confirm that there is no question of the PC1512 being discontinued.

"Although the PC1512 has sold well into the business sector, we recognise that the corporate customer, which we define as 'bulk orders through central purchase' has not bought the PC1512 in large quantities.

"We expect the PC1640 with EGA to satisfy the demands of this business sector, whilst the PC1512 will continue to sell into the smaller commercial operation, and into the home for out-of-hours business applications."

Amstrad launched the new PC range at Comdex in Atlanta, USA, earlier this month. The company made clear then its intention to target the machine at the US market, with the UK launch originally expected no sooner than the New Year.

US deal for Magister

MAGISTER Software last week announced a licensing deal with US giant Mindscape for its forthcoming release *The Powers of Armelin*.

The contract covers North America and Japan, while Magister itself will be handling the game in the UK and Europe when it's released early next year.

Mindscape publishes much of the best 68000-based games software, including *Balance of Power* and the critically-declaimed Cincomandre range. Its own products are handled by Mirrorsoft in the UK.

Magister specialises in 16-bit products. *Armelin* was written on the company's target machine, the Atari ST, and there will be a simultaneous release on the ST with an Amiga version. Macintosh and IBM versions will follow.

SOFTWARE HOTLINES

In 1984, the accepted style for writing press releases about computer games was to start off, "A revolutionary new concept ..."

Times have changed, however. These days, no press release is complete unless it includes the words, "what could be one of the most controversial pieces of software yet."

This week's "most controversial" game is *High Frontier*. **Activision** has commissioned this title from Alan Steel, whose track record must be littered with controversy, since he was the co-author of **PSS's Theatre Europe,** one of the most controversial, etc, etc.

High Frontier is more of a Theatre SDI, with you in charge of the American Strategic Defense Initiative, looking after its development, and if you play through far enough, repelling a Soviet nuclear attack.

Leaving any questions about the responsibility of bringing this type of game out aside until we've had a chance to see the finished version (though I hear they do very well on the Russian black market), it will be out next month for Spectrum, Commodore and Amstrad machines. *High Frontier* costs £9.99 on tape and £14.99 on disc.

Infocom is now churning out games at an astonishing rate. I can remember when you used to wait agonishingly for months for the next Infocom masterpiece; these days, another Infocom release whizzes past you before you've got past two locations in the current title.

North Face

Hot on the heels of *Bureaucracy* comes *Stationfall*, sequel to, you've got it, *Planetfall*.

Author **Steve Moretsky** has brought back Floyd the robot to accompany you on a seemingly routine assignment to a nearby space station to pick up some forms.

Once at the space station, you discover the place is populated only by an ostrich, and Arcturian balloon (a what?) and Plato, another robot. There's been a machinery breakdown and Floyd's showing signs of metal fatigue.

Stationfall should be released pretty much nowish, on disc only for Commodore 64/128, Amiga, CPCs and PCWs, Atari 8-bits and STs, PCs and clones, Apple II, and Macintosh. Prices range from £25 to £30.

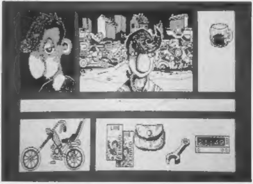
This week's picture plugs are for two French import **Infogrames'** games: *North Face* (which was originally called *Bivouac*, but someone obviously decided that sounded too French) and *Sidewalk* – which is the mono icon screen and looks quite unalterably French.

North Face is mountain climbing with 'arcade adventure elements'; collect all the ice picks in your quest to find the top of the mountain but watch out for those sneaky avalanches, I'd guess.

Sidewalk, according to Infogrames' David Crosweller, is "really hip", which shows his age. Let's just say it's jolly nice.

Christina Erskine

Sidewalk



DIARY DATES

JUNE

30 June–2 July
PC User Show
Olympia, London
Details: Hardware and software for all users of IBM PCs and compatibles
Price: £5
Organiser: EMAP International Exhibitions
01-608 1161

JULY

10–12 July
Amstrad Computer Show
Alexandra Palace Pavilion, London
Details: Displays and demonstrations of all latest hardware, software and peripherals for Amstrad computers
Price: £3 adult, [illegible] children, £1 discount for advance booking
Organiser: Database Exhibitions,
061-456 8835

24–26 July
Acorn User Exhibition
Red Hall, Barbican Exhibition Hall, London
Details: Latest hardware and software plus seminars
Price: £2, advance, £3 on the door
Organiser: Redwood Publishing 01-836 2441 Ext. 275

SEPTEMBER

23–27 September
Personal Computer World Show
Olympia, London
Details: Latest hardware, software and peripherals for business and leisure computing
Price: £3, £2 - (parties over 10)
Organiser: Montbuild
01-486 1951

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

ST & Amiga lose out on business software

DESPITE the best efforts and intentions of Commodore and Atari, the major business software houses - including Ashton-Tate, MicroPro, Microsoft and Borland - look set to ignore any new markets which may be created by the Amiga A500 and Atari STs.

A straw poll of the majors by *Popular Computing Weekly* reveals that they are adamantly refusing to stray from the IBM-compatible path.

"As far as I know, we are staying with IBM compatibles and PS/S," said a spokeswoman for Borland, which spearheaded the drive to low-cost software with *Turbo Pascal*, *Turbo Prolog* and *Sidekick*. This despite the fact that most Borland products have been converted for the Apple Macintosh.

Ashton-Tate's marketing director George Fletcher had never even heard of the Amiga.

"I'm not familiar with that machine [illegible] all," he admitted.

MicroPro is another of the companies for which it is IBM or nothing, but Mark Plant of Microsoft did at least admit the possibility of the company catering for the 68000 machines.

A500: 'Not familiar with that,' said Ashton-Tate.

"There is [illegible] two-pronged answer to this question - firstly, in terms of product development, decisions are made in the United States. Secondly, we would have to look at the market, and see the penetration and commercial success of the machine.

"I'm sure that they are looking at the Amiga, but that would be for them to decide."

So although there are a number [illegible] business and 'home productivity' packages already appearing for the Amiga and ST, it was expected that one or more of these companies would announce their own entry to the market.

None has produced a single business package for the Atari ST since its announcement two years ago, despite Microsoft's commitment to produce an ST wordprocessor, called *Write*, which never appeared.

This lack of support bodes ill for both machines. The difficulty of any machine breaking the business market can be measured by the fact that it took Apple two years to achieve substantial business sales with the Macintosh, even with the support of top-line business software from Microsoft and Lotus.

AMS goes for PC1512

ADVANCED Memory Systems has announced a desktop publishing package for the Amstrad PC1512 which it will be launching [illegible] September's PCW Show.

Finesse is the latest in [illegible] string of AMS DTP packages for machines such as the BBC and Amstrad CPC. Details are still sketchy, and no price has been announced yet.

"We've looked at all the other packages in the market, integrated their good parts where possible, and added some original ideas to come up with a system that [illegible] easy to use," said Nick Pierson, of AMS.

"Although the output is at its best from a laser printer, the results we have achieved with [illegible] 9-pin dot matrix are fantastic.

"I wanted to prove that you can produce a desktop publishing package that doesn't need [illegible] professional typesetter to operate it."

The announcement comes just a week after AMS announced it was changing the name of its other packages from *Pagemaker* to *Stop Press*, after a minor dispute over the name *Pagemaker* with Aldus, the world leader in desktop publishing software.

New face appears at Epyx

US GOLD has announced the appointment of Helen Browne as product manager for the Epyx range.

Browne was previously at the Lucas Electrical Company, and will now have responsibility for European sales, distribution and marketing of Epyx products.

Laurel and Hardy
Larry Harmon Pictures Corporation
Laurel & Hardy

NEXT WEEK

Gold on Micronet

Steve Gold brings you the latest news from the Prestel database Micronet, and developments on the Telecom Gold gateway, which links the two networks.

Microperipherals

MP-480 printer

Sophisticated printing at an unsophisticated price. Tony Kendle reports.

First steps in machine code

It's the final steps next week, as Kenn Garroch concludes his series on understanding machine code.

We'll have further features on learning machine code later in the year.

COMING SOON

Arnor C Compiler

Hard on the heels of all those C packages we were talking about just a few weeks ago comes Arnor's C – a compiler, linker and editor for CP/M Plus machines. Kenn Garroch reviews this latest entrant in the field.

Graphics

We'll be beginning a new series on how to get the most out of a computer graphics packages – how to turn those straight lines and filled circle facilities into portrayals of Botticelli's Venus.

LEARNING QWERTY ON THE IBM PC

Machine: IBM PC and compatibles.
Item: *PC Touch Typist.*
Price: £29.95.
Details: *PC Touch Typist* is an interactive typing tutorial aimed at first-time users of PCs.

Sagesoft MD David Goldman quotes market research which claims that word processing [illegible] currently the most popular low-cost business software application.

"This indicates that there are a lot [illegible] people who will be using a keyboard for the first time. Sage has produced [illegible] new package that will enable them to become touch typists quickly, easily and affordably," he said.

Contact: Sagesoft, NEI House, Regent Centre, Gosforth, Newcastle-upon-Tyne NE3 3DS, telephone 091-284 7077.

Masterly Spectrum

Machine: Sinclair Spectrum Plus 3.
Item: *Masterfile Plus 2* database.
Price: £29.95
Details: The latest version of *Masterfile* is a follow-up to previous *Masterfile* products for the Spectrum and Amstrad CPC and PCW 8256/8512.

Following comments from users, *Masterfile Plus 3* has 62K Ram instead of 31K, and facilities for table look-up, file import/export and file merge.

Contact: Campbell Systems, 7 Station Road, Epping, Essex CM16 4HA.

CASH IN HAND ON CPC & PCW

Machine: Amstrad CPC 6128 PCW 8256/8512.
Item: *Cash Book* financial forecasting package.
Price: £12.95.
Details: This is aimed at the home and small business market, and is described as a "simple to use journal/analysis system".

The working file can support over 300 entries, and the product can produce an infinite number of abstractions and analyses, as well as produce statements.

Contact: Double-Jay Software and Services, PO Box 5, Redruth, Cornwall TR16 1JJ, telephone (0209) 217552.

C64 EPROM

Machine: Commodore C64 and 128.
Item: Eprom programmer.
Price: £75.
Details: Program 2716, 2732, 2764, 27128, 27256 chips. The unit has a programming voltage of 12·5V or 21V, and is menu-driven.

There are also the following optional extras available: Rom board 1, Rom board [illegible], and an Eprom board for 16 Eproms.

Contact: Trilogic, 329 Tong Street, Bradford BD4 9QY, telephone (0274) 684289.

Arabic Amstrad

Machine: Amstrad CPC 464/6128.
Item: *TMC-100* Arabic conversion.
Price: To be announced.
Details: The *TMC-100* is a hardware kit which plugs into the expansion port of the CPC, and makes the machine bilingual. The conversion makes programming in Arabic and in Arabic Basic possible.

The product supports, in Arabic and English, most dot matrix printers. It should be of interest to anyone developing Arabic software, or teaching Arabic Basic.

Contact: Al-Tukhaim Microcomputer Centre, Rodney House, Castle Gate, Nottingham NG1 7EW, telephone (0602) 585737.

THE MEGA ST

The first preview of the new Mega ST was held last September. Now, at long last the machines are ready to go, and Duncan Evans has the review.

Tramiel's Atari has been renowned for announcing and previewing its machines long before release date and this has certainly been the case regarding the Mega STs. It was at last year's PCW show in September that Atari first revealed in a back room, away from public inspection, a mock up of a Mega ST.

Well, it's now June and the machines have finally arrived. Are they worth the wait? Read on and see.

Hardware

The design has been completely changed, so that as Commodore's Amiga A500 has been rehoused to look like an STF, so the new machines now look like an Amiga 1000. What this means is that the keyboard is now detached from the main unit which houses the main circuitry and the disc drive.

The main unit is a slim affair measuring approximately 13 inches square and just over two inches high. The top is, of course, flat to facilitate the placing of a monitor there. As far as the interfaces go, all the old favourites are still present. These include the cartridge port, serial, printer, power cable, Midi In and Midi Out, monitor, hard disc, external disc drive, a slot for the new expansion bus, the on-off switch and finally the reset button.

Putting the reset button on the back of the system unit is annoying, as it means that you have to get up and peer round the back of your monitor every time you want to do a reset. There is, of course, no TV modulator, because this is a Serious Machine.

Over on the keyboard unit the only interfaces are two joystick/mouse ports. The actual keyboard itself seems to have been improved, the keys rattle less (although the space bar on the review machine didn't look too well), and have a more positive and sturdy feel to them. Whether it's up to prolonged use, in say a word processing capacity, only time will tell.

The function keys are still there, in the same slanted styling as the air vents, which now aren't. Pretty though they may be, they are not the most functional of shapes. Something that is still missing is a Caps Lock light, which would have been handy.

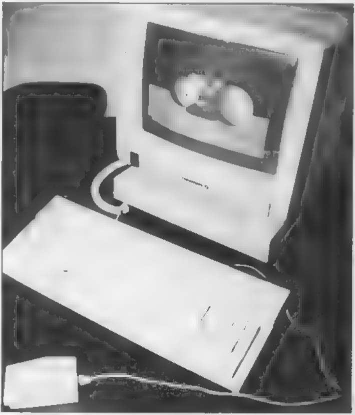
A nice additon to the keyboard though are the fold out legs underneath which make it more ergonomic. Looking inside the system unit the circuit board has been redesigned to cater for the extra Ram chips, blitter and the 68000 expansion bus.

Also inside are a cooling fan (precautionary for when you've got all those extras connected to the bus) and a one megabyte disc drive (720K formatted).

The Ram chips lurk underneath the drive, and consist of 32 or 16 one megabit chips (for a 4Mb or 2Mb machine respectively).

The Tos and Gem Rom chips are the same as before except that a couple of bugs have been removed. So all the graphics (including the need for a monochrome monitor in hi res mode), sound, and Midi facilities remain as was.

When the machine is switched on the internal fan revs up and begins to chug away relentlessly. Add to this the noise of



the disc drive rattling away inside the main unit, which acts like an echo chamber for it, and the result is a pretty noisy system. It's not intolerable by any means, and this was a much molested review machine, but it would have been nice to have been able to turn the fan off. As the circuit board is so clean and compact and the system box relatively roomy a fan strikes me as being overcautious.

Software

So, you've got this great wallop of memory, what are you going to do with it. Well, for one thing Atari sees the Mega STs as being its bid for the Apple dominated desktop publishing market. All because the forthcoming Atari Laser printer which will probably be around £1000 and certainly under £1500 requires 1.5Mb of the host computer's memory in order to work.

There aren't any, and won't be for some time, any specific programs for 2Mb machines, though 1Mb product is starting to appear, especially on the music front. So, desktop publishing apart, the main use of the extra Ram will be to use existing software to greater effect. Applications in the video digitising, sound sampling and music markets, particularly when used with a hard disc.

Other uses are really in the productivity department. Imagine a system with a one-megabyte Ram disc, a large printer spooler, all the desktop accessories you like, a couple of big applications packages and something like Kuma's *KSwitch* to swap between them.

> **"The other feature of the new machines is the long awaited for, blitter. The blitter (block image transfer) is the chip which can move large sections of memory around quickly, the area of obvious use being graphics manipulation"**

You'd ony have to use the drives when you switched the system on and turned it off at the end of the day. It's all possible with a Mega ST.

The other feature of the new machines is of course the much talked about, and long awaited for blitter. The blitter (block image transferer) is the chip which can move large sections of memory around quickly, the area of obvious use being graphics manipulation.

Realising that software that doesn't follow official procedures in using graphics will crash, Atari has incorporated the ability to turn the blitter on and off. Even better, this option is available from the dekstop, under the Options menu. Programmers have also been given a low level call to effect the same thing from within a program.

The main reason that the blitter will cause software to crash is in those programs that instead of going to the A-line graphic routines, which are accessed by a Trap #14 exception, bypass them to use the programmers' own faster routines. This is the price for being naughty.

As far as drawing and fills go the increase in speed is only marginal. The real advantage in having a blitter is in scrolling and animation, the latter being enhanced quite substantially.

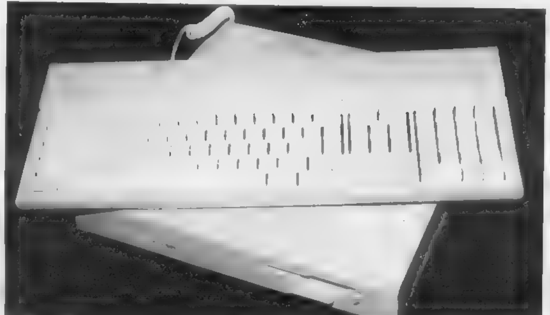
Conclusion

The Mega ST's are undoubtedly powerful machines but there are a couple of design flaws that could have been avoided/rectified. In their new configuration the 2080 and 4160 STs are being aimed at the business and scientific markets, but it remains to be seen whether Atari can get its act together to promote and organise the machines effectively.

The problem of needing two monitors to display all the graphics modes should have been rectified, so it's a shame that Atari haven't taken this opportunity to do so.

Another point to note is that the system box isn't large enough to accommodate a second disc drive. Having an external drive doesn't tend to spoil the smart look to the system.

All that said though the Mega STs represent excellent value in the pence per kilobyte rating, around 35p for the 4Mb version, and are a useful, powerful and impressive addition to the ST family.



The new Disciple for the Spectrum faithful

Christopher Jenkins reviews the revised version of Rockfort's Disciple Multi-Interface for the Spectrum.

Recent controversy over Amstrad's disc-based Spectrum Plus 3 has centred on two important aspects; the price, and the impossibility [illegible] Plus [illegible] owners upgrading to the Amstrad's 3 inch disc system.

While the Plus 3's £249 price tag [illegible] enough to protect the market position of the £149 Plus 2, many owners of the Plus 2, 128K and Plus must be fuming at the impossibility of adding an Amstrad disc drive to their set-up. However, a partial solution is at hand in the form of the Disciple interface.

The Disciple has been around for some time, but recent improvements ("version 3") plus the topicality of Spectrum disc systems should give it a well-deserved boost. Similar in physical appearance to Sinclair's Interface One, and indeed fully compatible with it, the Disciple offers [illegible] host of features which we'll look at briefly before covering the [illegible]-important disc functions.

The Disciple comes supplied with [illegible] cassette program which enables you to configure your equipment set-up. Having answered [illegible] series of yes/no questions about the disc drives, printers and other peripherals you are using, you can then produce a system disc which is loaded into the interface's Ram before each session.

The Disciple has two standard joystick sockets operating in Sinclair, Kempston, or keyboard emulation modes. [illegible] has a 26-way (BBC type) Centronics port suitable for a wide range of Epson and other printers, and two network connectors allowing up [illegible] [illegible] similar computer/Disciple systems to communicate.

A through port allows further hardware to [illegible] connected, while an inhibit button allows the interface to be disabled in cases of incompatibility. However, most mouse and Midi interfaces apparently will not work with the Disciple at the moment, although plans are in hand to overcome this problem.

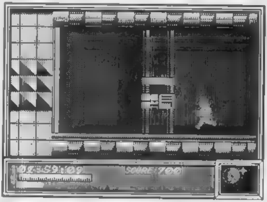
So, the Disciple is a powerful system interface even without the most significant features; the disc interface and snapshot functions.

The BBC-type 34-way IDC connector allows two drives to be connected; and, significantly, they can be of any format you require, 3 inch, 3½ inch, or 5¼ inch, single or double density.

Rockfort is pushing the Disciple in [illegible] package with [illegible] 3½ inch drive, largely because this is the most modern and economical system currently available.

Using [illegible] 40-track single density, single sided disc drive, storage [illegible] 80K per disc, with data transfer of 125Kbits/sec. The nominal access and load times for a 7K screen display would be 800msec.

At its best, though, with an 80-track, doubled sided, double density drive, storage is 780K and data transfer shoots up to 250Kbits/sec. Access time for a 7K screen would now be 350msec.



An example of the high quality screen dumps that can be obtained with the Disciple and an Epson printer

> "The Snapshot button on the side of the interface may well be the key to its success. Hold the Caps Shift key and press the button, and any program in memory may be suspended. You then have three options, depending on how much you want to save"

The Disciple DOS is based on microdrive commands, but offers many more advanced facilities. The CAT command lists the file number (one to 80), name (up to ten characters), number of disc sectors used, and type of each file on the disc.

File types include Basic, machine code, screen, microdrive, data array, character array, special files as used by some word processors or assemblers, and snapshot (of which more later). There's also an Execute file which will load itself into the Disciple's disc Ram and auto-run, allowing you to set up a series of different operating systems.

The CAT display also shows the start address of each program and space remaining on the disc. An abbreviated directory is also available using CAT!, which just lists the file names.

All the normal Basic saving, loading, renaming and verifying techniques can be used with the Disciple, with the addition of a specifier for the drive in use. If you try to save a file using a name which already exists, the system will ask you if you wish to overwrite the file.

Wildcard facilities are also available for erasing, renaming or copying batches of files.

It's also possible to read and write to sectors of the disc from Basic, making powerful disc editing programs possible.

The Snapshot button on the side of the interface may well be the key to its success. Hold the Caps Shift key and press the button, and any program in memory will be suspended. You then have three options; pressing 3 saves the current screen to disc as a 7K file, pressing 4 saves an entire 48K program to disc, while 5 saves an entire 128K program.

The problem of disc software availability, then, needn't bother the Disciple owner; 98 per cent of programs tested by developer Miles Gordon Technology transfer easily to disc. This facility is also a boon for games

continued on page 16 ▶

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players where there is no other game save facility offered, and also allows the user to produce large vertical or horizontal screen dumps using any Epson-type printer

In the absence of complete information – Amstrad being reluctant to supply full details of the Plus 3's operating system to other hardware suppliers – Alan Miles speculates that Plus 3 disc software will not work with a 3 inch Disciple system. However, he argues that initially there will be very little Spectrum software available on disc which will not also be available on cassette – and therefore available for transfer to disc by Disciple owners.

Disciple owners may even be in a better position than Plus 3 owners in many ways, for instance, they will still be able to use Microdrives if they so wish which the Plus 3 does not allow. A regular users' magazine, *Format*, contains useful tips, listings and techniques for making the most of the Disciple

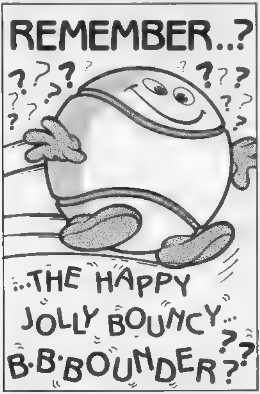
While Alan Miles stresses the Disciple's unique abilities, he's aware that comparisons with the Plus 3 are inevitable. Costwise, assuming that an old Spectrum might be sold for £50 to £70, the £180 to £200 cost of a Disciple and disc drive balances well against the £250 of a Plus 3.

In terms of performance, the Disciple offers up to 780K of continuous access on one drive, while the Plus 3 offers 350K. Speeds are roughly comparable, while 3½ inch discs are certainly cheaper than 3 inch. Using the snapshot facility, the software library available to Disciple owners is very large, though it will not run the CP/M programs which should be available to Plus 3 owners.

The Disciple means that upgrading Spectrum owners do have a choice other than selling their machines and buying a Plus 3. Amstrad's plans for the Spectrum range has left a niche in the market for an imaginative and versatile product

The Disciple Interface: will it work with the Spectrum +3?

Product *Disciple Multi-Interface* **Micro** Any Spectrum **Price:** £89.95; double-sided 80-track single 3·5 inch disc drive, £125; other drives and printers available **Supplier:** Rockfort Products, 81 Church Road, London NW4 4DP, 01-203 0191.



SAMPLE THAT!

The first two samplers for the ST have just been released – Eidersoft's *Pro Sound Designer* and Microdeal's *ST Replay*. Duncan Evans compares the two to find out which is the better product.

Sampling. The art of turning sound (an analogue quantity) into the digital information that a computer can understand or use.

Into the fray, competing for the wallets and purses of ST owners, are two low priced samplers. Eidersoft's *Pro Sound Designer* and Microdeal's *ST Replay* are the combatants.

Pro Sound Designer

The hardware plugs into the printer port and sports two 3·5mm jack sockets, one for input, the other for output.

If there's one thing you have to say about *Pro Sound*'s software, it certainly looks good. A centrally placed sound display is framed by bas relief icons on two sides, with a sample display underneath and a double row of yet more icons along the bottom.

Getting to the nitty gritty immediately. *Pro Sound* can sample at 3–30KHz and replay the sound in the same range. The sound can be saved to disc, played through your monitor speaker or played through a hi-fi.

To actually sample something, simply make [illegible] the required connections, set the input running (you'll see an oscillating waveform on the main display) and click on the record icon. A good feature is that you can set up [illegible] level threshold so that sampling doesn't start until the audio input is loud enough to trigger it.

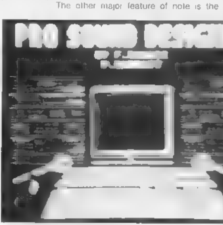
Once you have the sample in memory [illegible] appears in the sample window, wherein you can scroll [illegible] from start [illegible] finish. [illegible] couple of digital counters informing you of how far along you've got. In the window are two movable markers which are used when you want to manipulate parts of the sample.

You can cut sections out and overwrite others, or use the transparent copy option and overlay sections. The advantage of this is that you can create echo effects very easily. The disadvantage is that the overall sound level is decreased afterwards.

When playing a sample back, it is the section between the markers that is replayed, not the whole lot. You can play the sample backwards if you like, and have the whole thing looped for continuous playing.

You can zoom in on the sample magnifying sections [illegible] it for easier editing and then return to the standard resolution.

Along the left side of the waveform display are icons relating to eight function keys. You can program the keys to, not store part [illegible] the sample, but point to a particular part [illegible] the sample.



Pro Sound's cover screen

The other major feature of note is the provision of a sound chip programmer program. Select the chip icon and a couple of panels slide down either side [illegible] the main display. You can either program a sound by playing around with the hardware and software registers or load a sound, play it, and analyse its various components.

The function keys are again programmable but this time properly so anything you save will remain tied to that particular key. Sounds that you save can be incorporated into programs in assembler or C, or turned into data statements for ST Basic and *Fast Basic* users.

Now, ignoring the musical applications, see the conclusion for the reason, the main use of samples is going to be in your own programs. If you're a user of one of the languages mentioned in the last paragraph then you're lucky. *Pro Sound* gives details [illegible] the manual and an example program for C, and the basic programmers.

Samples played back from Basic do sound noisier than when using the *Pro Sound* software but even at 8KHz speech [illegible] still easily understandable.

The final comment must be on memory usage. Because *Pro Sound* [illegible] 113K in length you only get approximately 250K to sample with (on a 520ST). This translates to eight seconds at 30KHz or 30 seconds [illegible] 8KHz.

ST Replay

The Microdeal hardware consists of a slim cigarette-packet-shaped box that plugs into the cartridge port and contains two phono connectors for sound in and out, when not using the monitor speaker. The one big feature that the hardware can claim over the *Pro Sound* board is the provision of a filter to reduce the level of noise.

On the software side things don't look so good. There is no support for Gem [illegible] [illegible]. No mouse control, no icons, no menus. Instead all the functions are accessed by the keyboard. A single window which covers the entire sample, which you can zoom in on, is the main feature of the display. The rest of it [illegible] taken up with instructions and reminders of what the function keys are currently doing.

You can set *ST Replay* up to sample at 5, 7·5, 10, 15, 20 or 31KHz but not any intervening amount. Really the only place where the software scores over *Pro Sound* is in the Monitor function where you can hear an incoming signal being played at the current sampling rate, through the monitor. This gives you an audible cue for when to start sampling. It's still not as effective as *Pro Sound*'s Auto-Record option though.

If you want to edit a sample you have to move the two markers around by use of the four cursor keys, an unwieldy and badly conceived idea if ever there was one. You have to set the amount by which the markers move from [illegible] choice of large, moderate and very small.

Once there, there is not that much you can do anyway. Merely, cut out the section, play it backwards or forwards, or cut and make a duplicate.

You cannot cut out [illegible] section and insert it further up or down the sample. Nor can you overlay parts of the sample.

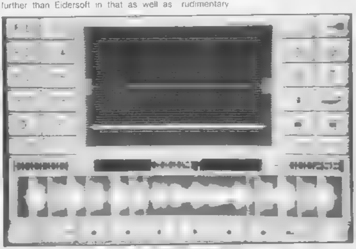
Once you've got the sample that you require you can save it to disc. Hopefully, I

◀ continued from page 17

say that because the software takes up so little room in memory you have more memory to sample in. You can sample for 13 seconds at 31KHz but, alas, you can only save 11 seconds worth on a half megabyte disc drive. In this case the other two seconds are trimmed off.

When it comes to using the samples in your own program Microdeal has gone further than Eidersoft in that as well as assembler and C, all three major Basics (Atari *Fast* and *GFA*) are supported with demonstration programs. They all use the same machine code file so are substantially similar. The software appeared to be more fallible than that used by *Pro Sound*, so greater care must be taken to get the desired result.

The hardware is really the class part of *ST Replay*, the software being very rudimentary.



The *Pro Sound* main display

Conclusion

Although both manufacturers are claiming that their samplers can be used by musicians, this is not quite true. Neither package supports Midi, which greatly diminishes their value to the professional musician, not that the *ST Replay* software is up to scratch anyway. Also, their top sampling speed is distinctly average in this sort of market.

Pro Sound boasts decent software and also a sound chip programmer utility, against which *ST Replay* counters with better (not a great deal but a noticeable) sound reproduction due to the built-in filter.

Both systems are perfectly usable for the enthusiast and computer programmer and have features to recommend them. It's also nice to be able to report that both manuals make fairly good stabs at explaining how their product works.

Whichever sampler takes your fancy you can't deny that at a mere fifty-five pounds the *Pro Sound Designer* package is a real bargain.

Duncan Evans

Product *Pro Sound Designer* **Price** £55 **Supplier** Eidersoft Ltd, The Office, Hall Farm, N Ockendon, Upminster, Essex RM14 3QH

Product *ST Replay* **Price** £129.95 **Supplier** Microdeal Ltd, Box 68, St Austell, Cornwall PL24 4YB

HE'S B-B-BACK!
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"COMING SOON"

How to start the machine code rolling

Kenn Garroch explains how to put machine code to use in writing programs

Having looked at the basics of machine code and assembly language, the next step is to have a look at how to actually write a program. You may have ideas for a game or an amazing piece of commercial software. How is the theory put into practice?

The first step is to define the program as precisely as possible and then break it down into easily manageable sections. Each of these sections should be determined so that they are easily programmed and tested on their own. If this is not the case then the section should be broken down further until it is simple enough to write in one go. When sections are defined, the programming can start.

There are a couple of methods of proceeding from this point. How you go about it is up to you, choose whichever of the following methods you like or develop your own.

Probably the oldest and perhaps most reliable method of defining programs is to use flowcharts. A flowchart is a method of setting out a program pictorially so that the sections can easily be defined and refined. The symbols set out in the diagram are used to define the various functions.

'Start' is placed at the beginning of each program and if it is a program section then it will usually have 'start names' where 'name' is the name given to the section.

Each separate action is then placed in an action box connected to the previous one by a line (the arrows are optional). When a decision has to be made, a decision box is used. This is the only box which has two exits since choices are made on a yes/no basis. Each of these lines loops backwards or forwards to the section to be jumped or branched to.

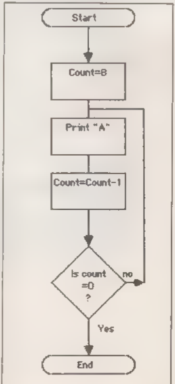
The end of a program or section is defined by an end box which, in the case of a section, will have the section name as well. The label box is optional and is included to allow connections to be made to other pieces of paper.

An example is to print seven 'A's on the screen. Each action is place in a box setting up the counter, printing the character, etc. After the count, a decision is made and if the count is not zero, the program loops back and prints the next A. It is usual to put yes or no on the lines exiting the box so you know where things are going and why.

To convert this to machine code, an instruction or group of instructions need to be assigned to the corresponding box – which gives the following:

```
SevenA LDX #8
loop   LDA #65
       JSR Print
       DEX
       BNE loop
       RTS
```

Note that the print A box has been split into two instructions to get the Ascii value of A into the accumulator, and then jump to a subroutine to do the actual print. This demonstrates the facility of flowcharts to point out the parts of the program that need to be split up into smaller sections, until they become simple enough to translate directly into machine code.



Example flowchart.

The only drawback with flowcharts is that, for large programs, they tend to become quite large and unwieldy. Using them takes quite a lot of page turning and you have to be neat about drawing boxes, otherwise the whole thing quickly becomes unreadable.

An alternative is to use a type of high level programming language that does not actually exist but is easily translated to cope with all of the capabilities of the processor. For anyone who has programmed in Basic, Pascal, C, or any other reasonably high level language, this method has distinct advantages.

For example, anyone who has programmed at any length in Basic will be able to write most of the routines straight into the machine, connecting them together later on when they are known to work. All microprocessors have equavalents to IF THEN, FOR NEXT, PRINT, INPUT, etc and if they don't there is always a way of putting together instructions until they do.

All you need to do is define routines for these particular commands and then write your program using them. So, with the example used for the flowchart, the program would be:

```
High level             6502               Z80
     X=8               LDX #8             LD D,8
loop PRINT "A"         LDA #65 JSR print  LD A,65 CALL print
     X=X-1             DEX                DEC D
     IF X< >0 THEN loop BNE loop          JR NZ,loop
     END
```

This, I find, is much easier than mucking around with all those tedious little boxes used with flowcharting. It is possible to take advantage of macro assemblers (see last week) with this method since they can be used to automatically perform the conversions if the commands are set out carefully.

The only difficulty with doing it this way is that breaking down the program into smaller sections is sometimes not so easy.

The sectioning of the program does, however, become more apparent when doing the translating and, if the program idea was split up properly in the first place, writing the subsections using the above method is usually pretty straightforward. For more information on this type of programming, see *Software Engineering For Micros* by T G Lewis (Hayden Book Company, Rochelle Park, New Jersey, USA, ISBN 0-8104-5166-2).

NEW AN
NOW OTHER HOME CON

Amiga 500 is here.

With a mind-blowing array of features and capabilities.

And a £499‡ price ticket (ex VAT), hundreds of pounds less than anyone could have predicted.

"...a miracle of compression..." writes *Popular Computing Weekly** "...it all adds up to a formidable system which is clearly better than anything else at the price."

This elegant little machine takes family computing into new dimensions of creativity, excitement and productivity.

It outruns and outguns office PCs as a business multi-tasker, performing a deskful of different jobs simultaneously, at over 7 million steps per second in realtime.

So other home computers may not be the only machines it consigns to the toy cupboard.

AMAZING SCIENCE FACT!

Amiga is used by Disney, Universal and other Hollywood studios for its dazzling 3D graphics manipulation and animation powers.

A sophisticated high-speed graphics processor called a blitter chip transforms images in realtime.

You can paint the screen with more than 4,000 colours. Create and modify designs and effects as you like, with pin-sharp resolution.

You command an almost limitless workshopful of stunning professional graphics capabilities.

With an optional Genlock interface, you can capture images off videotape. Manipulate and mix them with graphics. Then re-transfer them to videotape!

This means you can produce spectacular special effects like those created by Amiga computers for Channel 4's *Chart Show* and the American TV science fiction series *Amazing Stories*.

YOU AIN'T HEARD NOTHING YET

Concealed within the sleek Amiga shape, there is also a pro-quality sound synthesiser an four-track stereo sound system.

Driven by another powerful and unique custom chip, it can synthesise musical instruments an

‡Includes DeluxePaint from Electronic Arts worth £79 + VAT! · Excludes monitor or TV modulator.

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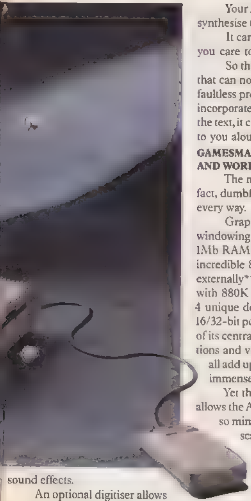
IGA 500.
PUTERS ARE JUST TOYS.



sound effects.

An optional digitiser allows you to take onboard real sounds. Mix and modify the two. Translate your compositions from keyboard to sheet music. Play them back through the monitor's speaker or your hi-fi.

Your Amiga can also synthesise the human voice.

It can speak back anything you care to write on the keyboard.

So this is one computer that can not only word process with faultless professionalism, and incorporate superlative graphics into the text, it can also read the text back to you aloud.

GAMESMANSHIP AND WORKMANSHIP!

The new Amiga 500, in fact, dumbfounds its competitors in every way.

Graphics, stereo sound, multi windowing, multi screens, 512K to 1Mb RAM (expandable by an incredible 8 further megabytes externally[**]), 3½" internal disk drive with 880K of mass memory, 4 unique dedicated chips plus the 16/32-bit power and 7.14MHz speed of its central processor, communications and vast expansion potential all add up to a computer of immense professional capability.

Yet the same technology allows the Amiga 500 to play games so mind bending that only full-scale arcade machines have been able to play them until now.

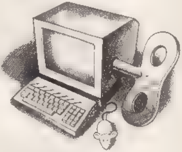
AND AMIGA MEANS 'FRIEND'!

However many of the Amiga's extraordinary talents you find yourself using, they will all be beautifully simple and natural.

You will be totally at home in the friendly and effortless Amiga environment, where everything happens by windows, icons, mouse and pulldown menus.

And the Amiga 500 simplifies life in another way too.

There is now no comparable home computer. At any price.



Try the astonishing new Amiga 500 at your nearest Commodore Amiga dealer.

And discover why *Personal Computer World*[†], having tested the graphics performance of Amiga's latest and most powerful rival, concluded "...Amiga still reigns supreme..."

AMIGA.

Commodore

---

[*] *Popular Computing Weekly*, 22-28 May 1987. [†] *Personal Computer World*, February 1987. [**] *Subject to availability.*

PROGRAMMING: SPECTRUM

Screen mover

David Bailey

This program for any Spectrum is an extremely fast and flexible screen block mover. It will save any portion of screen to memory and then reload it back anywhere on screen. This can be done in black and white or colour.

First type in Listing 1 and save it to tape or microdrive for an address to place the code. It [illegible] 350 bytes long and entirely relocatable. The program will now *POKE* the machine code into memory, telling you if you have made any errors. If you have not, you will be told how to save the code.

To use the listing yourself, several parameters must be set:

Label	*Address*	*Function*
WIDTH	23296	This is the width of the area to be copied, in characters.
HEIGHT	23297	This is the height of the area to be copied, in characters
WIPE	23298	This is set to 1 when you are saving a screen block, the block will be wiped from the screen as it saves it. Setting it to 0 leaves the screen untouched
CODE	23299 & 23300	This is where the screen data is stored (see below).
X	23301	This is the X position of the top left-hand corner of the area to be saved or loaded to.
Y	23302	This is the Y position of the top left-hand corner of the area to be saved or loaded to.
TYPE	23303	If this is 0, the program will save a block of data from the screen into memory but if it is 1, then the program will load [illegible] block of data onto the screen from memory.
COLOUR	23304	Set this to 1 for colour screen copying or to 0 for black and white.
START	23307 & 23308	The start of the main code in memory (see below).

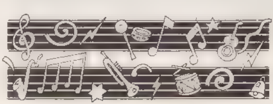
On the two byte labels the first address must be *Poked* with the LSB value and the second with the MSB.

```
  10 REM SCREEN BLOCK MOVER
     1987 D.Bailey
  20 PRINT "Please type in the address w
hereyou want the code to go:": INPUT a:
IF a<16384 OR a>65195 THEN  PRINT "Inval
id address!": STOP
  30 POKE 65535,INT (a/256): POKE 65534,
a-256*PEEK 65535
  40 CLEAR a-1: LET a=PEEK 65534+256*PEE
K 65535
  50 LET line=200
  60 DEF FN p(a$)=16*(CODE a$(1)-48-(7 A
ND a$(1)>"9"))+CODE a$(2)-48-(7 AND a$(2
)>"9")
  70 PRINT "Please Wait": LET x=0
  80 FOR y=1 TO 35: PRINT AT 2,0;35-y;CH
R$ 6: LET sum=0
  90 READ a$: IF LEN a$<>20 THEN  GO TO
1000
 100 FOR z=1 TO [illegible] STEP 2
 110 LET h=FN p(a$): LET sum=sum+h
 120 POKE a+x,h: LET a$=a$(3 TO )
 130 LET x=x+1: NEXT z
 140 READ check: IF sum<>check THEN [illegible]
TO 1000
 150 LET line=line+10: NEXT y
 160 PRINT "Code all correct!"''"Save by
typing GOTO 180 or load demo program whi
le code is stillin memory."
 170 STOP
 180 SAVE "screenmove"CODE a,350: STOP
 200 DATA "3A005B473A055B80FE21",789
 210 DATA "300C3A015B473A065B80",564
 220 DATA "FE18380A1100072120C01",654
 230 DATA "C0B503C909720958ED5B",1269
 240 DATA "0B5BD93A075B872066D9",1009
 250 DATA "213800D9185DD9E5ED5B",1197
 260 DATA "035B3A025B4F3A015B47",545
 270 DATA "C5060BC5E53A005B477E",983
 280 DATA "12AFB92B02AF77231310",784
 290 DATA "F4E124C110E925D92168",1338
 300 DATA "00D91B670 9C110DAE13A",1271
 310 DATA "085B872B5ED9217A00D9",1005
 320 DATA "1859D93A015B47C5E53A",1035
 330 DATA "005B477E12231310FAE1",851
 340 DATA "0120009C110EC183C18",595
 350 DATA "36D9219E00D9182FD9ED",1204
 360 DATA "5B035BEBD53A015B47C5",1051
 370 DATA "0608C5D53A005B477E12",788
 380 DATA "231310FAD114C110EF15",1018
 390 DATA "D921C600D9EB183CD9EB",1436
 400 DATA "C110DE1B0B185A183118",674
 410 DATA "6B1677D13A0B5BB72B62",937
 420 DATA "D971F400D9EB1B6BD9FB",1510
 430 DATA "3A015B47C5D53A005B47",851
 440 DATA "7E12132310FAD1012000",706
 450 DATA "EB09EBC110EA1B3C057C",1343
 460 DATA "E607FE0728032418187D",750
 470 DATA "E6E0FEE0280B11E006A7",1394
 480 DATA "ED5218097CFE572B0411",678
 490 DATA "200019D1D919E9ED4B05",1058
 500 DATA "5B78E6FBC640677BE607",1411
 510 DATA "0F0F0F816FD919E9D93A",1019
 520 DATA "095BD92A035BEBED52E5",1236
 530 DATA "C1C97C0F0F0FE603F658",1130
 540 DATA "67D919E900EB80B0E603",1299
1000 PRINT "Error in line ";line: STOP
```

PROGRAMMING: AMSTRAD CPC

Khandal 2

Ian Grainger



Part three of Khandal 2, and the last part of listing one. The icons on the right of the screen are.

Examine, which allows you to peruse the object currently displayed [illegible] the carry menu. You cannot examine objects that appear in blue underneath the main display but you should get a short description when said object is first picked up.

Get, allows you to pick up an item. Anything you were carrying previously will be dropped.

Give, hands over the object in the carry window to the character currently in the room with you.

When there is an object [illegible] the carry window a further icon appears which allows you to try to find a use for them. This can be dangerous.

For a tape copy of Khandal 1 and 2 send £3 to 33 Wellfield Road, Wingate, Co Durham TS28 5LA.

```
3520 RETURN
3530 REM Music envelopes
3540 DATA 0,4,0,1,80,1,0,1,180,2,1,13
3550 DATA 270,1,2,2,340,1,2,8
3560 DATA 390,1,2,15,440,1,5,20
3570 DATA 135,1,2,2,0,0,0,0
3580 :
3590 REM Machine Code Data
3600 DATA DD6601DD6E0022FA,3AB
3610 DATA 7FDD7E0432FD7FDD,469
3620 DATA 7E0232FC7FDD6697,377
3630 DATA DD6E0622FE7FC330,3E3
3640 DATA 8000000000000000,80
3650 DATA 0000000000000000,0
3660 DATA 2AFE7FED58FA7FED,555
3670 DATA 4BFC7FC5E51A0077,401
3680 DATA 231310F9E1010008,229
3690 DATA 0930040150C009C1,21B
3700 DATA 0020EBC900000000,1DE
3710 DATA 0000000000000000,0
3720 :
3730 REM Music data
3740 DATA 239,239,239,239,253,253,253
3750 DATA 253,190,190,190,190,190,190
3760 DATA 142,159,190,190,190,190,190
3770 DATA 000,000,000
3780 DATA 239,239,239,239,253,253,253
3790 DATA 253,190,190,190,190,190,190
3800 DATA 142,159,190,190,190,190,190
3810 DATA 169,159,190,169,169,169,169
3820 DATA 000,000,000
3830 DATA 239,239,253,253,319,319,319
3840 DATA 319,159,159,159,159,169,169
3850 DATA 169,169,190,190,169,169,159
3860 DATA 159,142,142,127,127,159,159
3870 DATA 169,169,169,169,169,169,169
3880 DATA 169,179,179,179,179,239,239
3890 DATA 179,179,190,190,213,213,239
3900 DATA 239,319,319,284,284,284,284
3910 DATA 239,239,239,239,213,213,213
3920 DATA 213,000,000,000,000,000,000
3930 DATA 000,000,000,000,000,000,000
3940 DATA 000,000,000,000,000,190,190
3950 DATA 190,190,159,159,159,159,239
3960 DATA 239,239,239,239,239,239,239
3970 DATA 179,179,179,179,142,142,142
3980 DATA 142,213,213,213,213,213,213
3990 DATA 213,213,190,190,213,213,239
4000 DATA 239,319,319,284,284,284,284
4010 DATA 239,239,239,239,213,213,213
4020 DATA 213,213,213,213,213,190,190
4030 DATA 213,213,239,239,319,319,142
4040 DATA 142,142,142,159,159,159,159
4050 DATA 119,119,119,119,119,119,119
4060 DATA 119,000,000,000,000,000,000
4070 DATA 000,000,000,000,000,000,000
4080 DATA 000,000,000,000,000,000,000
4090 DATA 000,000,000,000,000,000,000
4100 DATA 000,000,000,000,000
4110 :
4120 REM Drum data
4130 DATA 3,9,9,3,3,9,9,9,3,9,9,3,3,9
4140 DATA 9,9,3,9,9,2,2,2,9,9
4150 DATA 3,9,9,3,3,9,9,9,3,9,9,3,3,9
4160 DATA 9,9,5,9,9,5,5,9,9,9,5,9,9,2
4170 DATA 2,2,9,4,4,6,9,4,4,6,9,4,4,6
4180 DATA 9,4,4,6,9,4,4,6,9,4,4,6,9,4
4190 DATA 4,6,9,4,4,6,6,4,4,6,6
4200 DATA 7,7,6,9,7,7,6,9,7,7,6,9,7,7
4210 DATA 6,9,7,7,6,9,7,7,7,4,4,2,2,2
4220 DATA 9,9,8,8,8,8,[illegible],2,2,2,4,9,4,9
4230 DATA 4,9,4,9,6,6,6,9,6,6,6,9,6,6
4240 DATA 6,9,6,6,6,9,9,4,6,9,4,6,9,4
4250 DATA 6,9,3,3,3,3,3,3
4260 DATA 6,6,5,9,6,6,5,9,6,6,5,5,6,6
4270 DATA 5,5,6,6,4,4,2,2,2,2
4280 DATA 4,4,3,3,4,4,3,3,4,4,3,3,4,4
4290 DATA 3,3,4,4,3,3,4,4,4,4
4300 DATA 8,8,8,8,4,4,4,4,2,2,2,2,4,4
4310 DATA 4,4,8,8,4,4,2,2,4,4,6,6,6,6
4320 DATA 9,9,9,9
4330 :
4340 REM Character set data
4350 DATA 126,102,110,118,102,102,126,0,
16,48,16,24,24,24,126,0,126,2,2,126,96,9
6,126,0,126,2,2,30,6,6,126,0
4360 DATA 96,96,96,96,104,126,8,8,126,64
,126,6,6,6,126,0,126,64,64,126,98,98,126
,0,126,2,4,62,16,32,64,0
4370 DATA 126,66,66,126,66,66,126,0,126,
66,66,126,6,6,6,0
4380 DATA 126,66,66,126,98,98,98,0,126,6
6,66,126,98,98,126,0,126,64,64,96,96,96,
126,0,254,66,66,98,98,98,254,0
4390 DATA 126,64,64,120,96,96,126,0,126,
64,64,120,96,96,96,0,126,64,64,102,98,98
,126,0,66,66,66,126,98,98,98,0
4400 DATA 60,16,16,24,24,24,60,0,126,8,8
,24,24,24,120,0,68,68,68,120,100,100,100
,0,64,64,64,96,96,96,126,0
4410 DATA 126,74,74,98,98,98,98,0,98,82,
74,102,98,98,98,0,126,66,66,98,98,98,126
,0,126,66,66,126,96,96,96,0
4420 DATA 126,66,66,98,98,106,126,4,126,
66,66,126,104,100,98,0,126,64,64,126,6,6
,126,0,126,16,16,24,24,24,24,0
4430 DATA 66,66,66,98,98,98,126,0,66,66,
66,66,66,36,24,0,66,66,66,98,106,106,126
,0,102,102,36,24,36,102,102,0
4440 DATA 66,66,126,16,24,24,24,0,126,4,
8,16,32,64,126,0
4450 DATA 0,0,0,3,31,31,63,63,0,15,255,2
55,255,255,255,255,127,127,127,127,255,2
55,255,255
4460 DATA 255,255,255,255,127,127,127,12
7,63,63,31,31,15,3,0,0,255,255,255,255,2
55,255,255,15
4470 DATA 0,240,255,255,255,255,255,255,
0,0,0,192,240,240,248,248,252,252,252,25
2,254,254,254,254
4480 DATA 254,254,254,254,252,252,252,25
2,255,255,255,255,255,255,255,240,248,24
8,240,240,192,0,0,0
4490 DATA 0,0,0,1,2,4,14,31,0,64,160,16,
168,84,162,84,63,127,63,31,15,7,2,0,136,
208,224,192,128,0,0,0
4500 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,127,85,106,85,106,85,127,0,254,126,254
,126,254,126,254,0
4510 DATA 0,127,64,95,95,64,90,64,0,254,
7,250,[illegible],250,1[illegible]0,88,[illegible],9[illegible],61,91,64,1
7,0,250,254,170,250,250,2,254,0
4520 DATA 0,3,7,15,31,60,120,240,0,224,2
48,252,124,120,48,0,240,224,248,252,124,
120,51,0,0,0,4,24,96,128,0,0
4530 DATA 0,1,1,1,3,3,15,10,0,0,0,128,12
8,192,224,80,10,10,10,13,13,15,15,15,80,
80,80,176,176,176,176,240
4540 DATA 0,0,0,7,156,255,252,255,0,0,0,
192,56,254,1,254,252,123,120,124,124,124
,120,48,56,192,0,0,0,0,0,0
4550 DATA 0,0,0,0,8,4,34,16,0,0,0,128,14
4,40,80,160,9,2,101,10,20,40,18,2,76,128
,32,16,136,64,32,0
4560 DATA 0,0,0,63,64,78,81,64,0,0,0,248
,4,4,20,228,78,81,64,78,81,64,64,63,4,20
,228,4,20,228,4,248
4570 DATA 0,0,0,0,0,0,0,1,0,0,0,0,0,0,22
4,240,3,7,15,31,31,31,15,7,248,248,248,2
40,224,192,128,0
4580 DATA 0,3,1,1,7,15,25,49,0,192,128,1
28,224,240,24,12,49,49,48,48,48,24,15,7,
12,12,140,76,44,24,240,224
4590 DATA 0,0,0,0,8,20,36,64,0,0,0,0,16,
40,36,2,60,102,123,122,126,126,60,0,60,1
02,250,122,126,126,60,0
4600 DATA 0,0,0,1,0,0,0,1,0,0,192,32,144
,72,228,212,3,7,14,28,56,112,32,0,136,0,
0,0,0,0,0,0
4610 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
4620 DATA 0,0,3,4,8,16,17,18,0,0,255,0,0
,0,255,0,0,0,192,32,16,8,136,72,18,16,18
,18,18,18,18,18,72,72,72,72,72,68,68,68
4630 DATA 82,90,65,89,89,65,89,65,65,65,
65,65,65,65,65,65,18,18,18,18,18,18,18,3
0,65,65,65,65,65,65,65,127
4640 :
4650 REM Rivets'
4660 DATA 31113,00011,00101,01001,30003
4670 :
4680 REM Object data
4690 DATA TELEPORT PASS,DOOR PASS,GALACT
IC GAZETTE,TELEPHONE,OIL,LASER GUN,LUMIN
OUS ROD,BIOTHERMIC PLATE,SYNTHETIC FOOD
TABLET,WATCH,SUN SHADES,TELECOMUNICATOR
4700 :
4710 REM Examination data
4720 DATA "WRITTEN ON THE PASS CARD IS Y
OUR NAME AND A VALID TRANSPORT NUMBER."
4730 DATA "THERE IS WHAT LOOKS LIKE AN I
DENTIFICATION NUMBER ON THE CARD."
4740 DATA "YOU PAUSE TO READ THE PAPER,
AN ADVERT FOR KHANDAL III CATCHES YOUR E
YE. PRESS SPACE TO RESTART."
4750 DATA "IT'S NOT FOR YOUHOO..."
4760 DATA "A MANUFACTURERS STICKER READS
, HIGH PERFORMANCE ROBOT REFRESHMENT."
4770 DATA "IT LOOKS POWERFULL, MAYBE IT
S FOR A POWERFULL MACHINE."
4780 DATA "WHAT CAN I SAY, IT S LUMINOUS
!"
4790 DATA "IT COULD BE TOO HOT TO HANDLE
."
4800 DATA "ROAST TURKEY FLAVOUR, MMMMH."
4810 DATA "WOW... IT HAS 1059 FUNCTIONS
INCLUDING MINI TV, VIDEO, MINI HI-FI, AN
D INDUSTRIAL SUCTION PUMP."
4820 DATA "AREN T THEY JUST THE COOLEST.
"
4830 DATA "IT'S GREEN, DISPOSABLE, AND G
IVES A CLOSER SHAVE..."
4840 :
4850 REM Use data
4860 DATA "YOU TRY TO FOLD THE CARD INTO
 THE SHAPE OF A PAPER AEROPLANE BUT YOU
CAN T, SO YOU RETURN IT TO YOUR POCKET."
4870 DATA "IT'S NOT THE ACE OF SPADES YO
U KNOW!"
4880 DATA "YOU USE THE PUBLICATION TO [illegible]
ACTICE YOUR ORIGAMI."
4890 DATA "YOU CAN'T PHONE HOME, YOU'VE
BEEN DISCONNECTED."
4900 DATA "NOT YOUR USUAL DEODERANT TYPE
, BUT IT WILL DO."
4910 DATA "POW, POW, POW, PUT, PUT, PUT,
.... OUT OF POWER."
4920 DATA "IT CERTAINLY SEEMS TO BRIGHTE
N THE PLACE UP."
4930 DATA "SSSSSST, YOU SEEM TO HAVE SIN
GED YOUR FINGER!"
4940 DATA "MMMMM, BOOTIFUL, REAL BOOTIFU
L."
4950 DATA "YOU CAN T, THE BATTERIES ARE
FLAT."
4960 DATA "YOU CASUAL HIPSTER PERSON YOU
!"
4970 DATA "YOU CUT YOUR TOUNGE OFF, HA,
IT S A BIC DISPOSABLE RAZOR! THAT LL TEA
CH YOU TO EXAMINE THINGS!"
4980 :
4990 REM Icon control
5000 DATA &C891,&9329,6,14,&F931,&93D1,6
,13,&DA21,&93B0,6,13
5010 :
5020 REM Character data
5030 DATA &D1F1,&9519,12,5,22,&DA07,&942
2,11,4,21,&E9A2,&9635,3,4,27,&E19F,&95B0
,21,6,28,&D964,&9485,25,4,37
5040 :
5050 REM Room codes
5060 DATA 5,33,33,34,2,17,33,34,9,40,4,1
,41,33,34,17,36,3,37,40,1,49,40,17,32
5070 :
5080 REM Object positions
5090 DATA 0,106,0,0,9,0,0,11,3,0,101,110
,2,8,0,0,4,12,0,0,105,7,0,0,0
5100 :
5110 REM Khandal wall
5120 DATA &9194,&921B,&92A2
5130 DATA &9000,&9086,&910D
5140 :
5150 REM Character names
5160 DATA LLOYD,DUNCAN,CPR23002,ETA,MAGI
C KNIGHT
```

PROGRAMMING: QL

Zoom

S W Booth

This utility will allow you to zoom any part of memory to any other part of memory. The zoom uses a multiplication factor of eight and can be used [illegible] any mode. The code is 218 bytes long and can be loaded in the following fashion

Let zoom=RESPR(218)
LBytes mdv1_ZOOM_bin,zoom

You can then use *Call zoom, start, to, width, height* to activate the routine. *Start* [illegible] the address to zoom from (must be even), *to* [illegible] the address to start the printing of the zoomed area, *width* is the number of words (wide) that you want to zoom, and *height* [illegible] the number of pixels (high) that you want to zoom

```
100 start=RESPR(218):parity=0
110 FOR loop=0 TO 217
120 READ datum
130 parity=parity+datum
140 POKE start+loop,datum
150 END FOR loop
160 READ checksum
170 IF checksum<>parity:PRINT "ERROR in data.":STOP
180 SBYTES mdv1_ZOOM_bin,start,218
190 STOP
200 DATA 36,65,34,66,83,67,83,68,44,3,42,4,114,255,116
210 DATA 255,112,16,78,65,38,73,40,74,74,1,103,0,0,110
220 DATA 42,4,118,7,7,18,102,4,116,0,96,6,36,60,255
230 DATA 0,255,0,7,42,0,1,102,2,96,6,0,130,0,170
240 DATA 0,170,83,67,7,42,0,1,102,2,96,6,0,130,0
250 DATA 85,0,85,114,7,34,130,211,252,0,0,0,128,81,201
260 DATA 255,246,147,252,0,0,3,252,81,203,255,190,213,252,0
270 DATA 0,0,128,211,252,0,0,3,112,81,205,255,172,84,140
280 DATA 215,252,0,0,0,16,34,75,36,76,81,206,255,154,112
290 DATA 0,78,117,42,4,114,7,3,18,86,194,72,130,3,42
300 DATA 0,1,86,194,118,7,50,130,211,252,0,0,0,128,81
310 DATA 203,255,246,147,252,0,0,3,254,81,201,255,222,213,252
320 DATA 0,0,0,128,211,252,0,0,3,112,81,205,255,204,217
330 DATA 252,0,0,0,2,215,252,0,0,0,16,34,75,36,76
340 DATA 81,206,255,182,112,0,78,117
350 DATA 19748
```

PROGRAMMING: C64

Fx Creator

Sukhbir Singh Ranu

This machine code routine allows you to create sound, using any one of the three voices, by typing in a short sequence of number. The syntax for the new command is as follows

Sys 49152, VC, VL, AT, ST, WF, HI, LO, HP, LP

Where *VC* is the voice number (0–2), *VL* is the volume for all three voices (0–15), *AT* is the attack and decay (0–255), *ST* is the sustain and release (0–255), *WF* is the waveform (17, 33, [illegible] or 129), *HI* is the high frequency of the note (0–255), *LO* is the low frequency of the note (0–255), *HP* is the high pulse of the note (0–15) and *LP* is the low pulse of the note (0–255)

HP and *LO* only come into effect if you select a pulse waveform (65), otherwise leave them out or a syntax error will occur.

The listing, as well as containing the machine code, also features a short demonstration of the command. Press F1, F3 or F7 to select type of sound.

```
80 PRINT"■PLEASE WAIT........." I=49152
90 READ D:IF D=-1 THEN GOTO 110
100 POKE I,D:I=I+1:T=T+D:GOTO 90
110 IF T<>16664 THEN PRINT"■■ERROR IN DATA.■":END
120 PRINT "■USE KEYS 1-9 TO PLAY."
121 I=49152
122 PRINT"■■DRUMS." AT=7:WF=129:KL=45
125 REM ******* M.C DATA ********
130 DATA 32,241,183,138,201,0,240
140 DATA 15,201,1,240,9,201,2,240
150 DATA 3,76,72,178,105,6,105,5
160 DATA 133,251,168,169,0,153,0
170 DATA 212,153,4,212,153,5,212
180 DATA 153,6,212,32,241,183,142
190 DATA 24,212,32,241,183,138,164
200 DATA 251,153,5,212,32,241,183
210 DATA 138,164,251,153,6,212,32
220 DATA 241,183,138,164,251,153
230 DATA 4,212,133,252,32,241,183
240 DATA 138,164,251,153,1,212,32
```

```
250 DATA 241,183,138,164,251,153
260 DATA 0,212,165,252,201,65,240
270 DATA 1,96,32,241,183,138,164
280 DATA 251,153,3,212,32,241,183
290 DATA 138,164,251,153,2,212,96,-1
300 REM ** DEMO USING DRUMS & PIANO **
301 REM ***DRUMS ON V2,PAINO ON V1 ***
310 GETA$:IFA$=""THEN 310
320 IF A$="■" THEN AT=9:WF=33:KL=36:PRINT"■■PIANO."
    :QW=0:VC=0:GOTO 310
325 IF A$="■" THEN PRINT"■■MIX.   ":QW=1:GOTO 310
330 IF A$="■" THEN AT=7:WF=129:KL=45:PRINT"■■DRUMS.
   ":QW=0:VC=1:GOTO 310
340 CX=VAL(A$):IFCX>9 OR CX<1 THEN 310
350 IF QW=1 AND CX<5 THEN WF=129:AT=7:KL=45:VC=1
355 IF QW=1 AND CX>4 THEN WF=33:AT=9:KL=45:VC=0
360 NT=ASC(A$)-KL
370 SYSI,VC,15,AT,0,WF,NT,NT
400 GOTO 310
READY.
```

Panel Copy

A F Wilson

One of the best features of the Memotech MTX series computers is their built in assembler/disassembler, the Panel. Unfortunately, the one thing missing from it is the ability to dump the contents thereof, to a printer. This program remedies that problem

(1) For SDX Users

Type in listing, then type *GOTO 100*. This will autosave the program to disc as "*PANEL.COD*". To use the program, just type *USER LOAD "PANEL.COD"*. This will reload the program back into memory and auto-initialise itself in high memory. Therefore when you enter *PANEL*, function keys F5-F8, are now initialised (see later for meanings)

(2) For SDX/FDX CP/M Users

As in (1) except replace the references to ***USER*** with *DISC*.

(3) For Tape Users

As in (1), except remove the references to ***USER***. To load use *LOAD "PANELCOD"*.

You should now have on disc or tape a program called *PANEL.COD* or *PANELCOD*. This program is interrupt driven and is at top of free memory, therefore it won't be overwritten. However, when the computer is reset, the PANEL extension location at £FA9E is reset, and this subroutine will become invisible to the Operating System and PANEL. As the program is still in memory at the desired location, £B007, you simply re-initialise it with *RAND USR(45063)*

The screen is divided up into three key areas. The *disassembly*, the *registers* and the *Hexdump* at the bottom of the screen. This PANEL extension allows you to get a hardcopy of the whole PANEL screen **(F5)**, the disassembly and registers **(F6)**, the disassembly only **(F7)** and the *hexdump* only **(F8)**. See figure below for a snapshot of the panel whole screen

```
10 CODE

4007 JPANEL:LD A,£C3          ;SET PANEL EXTENSION WITH
4009        LD (£FA9E),A      ;JP £B012.
400C        LD HL,£B012       ;
400F        LD (£FA9F),HL     ;
4012 PSTART:LD A,(£FD7D)      ;WHAT WAS THE LAST KEYPRESS.
4015        CP £84            ;CHECK TO SEE IF IT ONE OF
4017        JR Z,F5           ;THE FOLLOWING OPTIONS.
4019        CP £85            ;
401B        JR Z,F6           ;
```

```
409A         JP NZ,PSEND          ;IF NOT F7,KEEP READING.
408C         LD A,(COUNT)         ;UPDATE ROW COLUMN COUNTER
408F         AND A                ;AND CHECK TO SEE IF END OF
4090         INC A                ;ROW YET.
4091         LD (£B0B5),A         ;
4094         LD B,A               ;
4095         LD A,(£B0B0)         ;
4098         CP B                 ;
4099         JR Z,UPDVDP          ;UPDATE VDP ROW COUNTER.
409B         JR PSEND             ;NOT AT LINE END YET.
409D UPDVDP:PUSH DE               ;MOVE VDP ON BY 40 (SCREEN
409E         LD DE,40             ;WIDTH).
40A1         ADC HL,DE            ;
40A3         POP DE               ;
40A4         PUSH HL              ;
40A5         XOR A                ;
40A6         LD (£B085),A         ;ZERO F7 COL COUNTER.
40A9         JP VDPSET            ;
40AB LF:     DB 27,"A",16         ;SET PRINTER SPACING.
40AE         DB 27,"Q"            ;SET COLUMN
40B0 COL:    DS 1                 ;WIDTH.
40B1 SCRNST:DS 2                  ;£B0B1
40B3 LENPAN:DS 2                  ;£B0B3
40B5 COUNT: DS 1                  ;£B0B5
40B6 END:    LD B,13              ;SEND CR.
40B8         CALL £0CE3           ;
40BB         LD B,10              ;SEND LF.
40BD         CALL £0CE3           ;
40C0         RET                  ;RETURN TO PANEL EDITOR.

20 CODE

MOVECODE: LD HL,£4007             ;(OR £B007) START OF CODE.
          LD DE,£B007             ;NEW LOCATION IN MEMORY.
          LD BC,186               ;LENGTH OF CODE TO MOVE.
          LDIR                    ;MOVE IT
          RET                     ;

30  RETURN
100 USER SAVE "PANEL.COD"
110 GOSUB 20
120 RAND USR(45063)
130 NEW
```

Evaluates

Adam Wright

This routine for the Commodore 64 will give ■ an *Eval$* type command. It is much the same as the command used on the BBC.

The syntax for the command ■ as follows

Sys 49152, string to be evaluated, variable to return result in.

```
0 REM EVALUATE$
1 DATA 32,253,174,32,139,176,166,13
2 DATA 208,3,76,72,178,160,2,177
3 DATA 95,208,3,76,72,178,133,251
4 DATA 200,177,95,133,252,200,177,95
5 DATA 133,253,162,3,160,0,177,252
6 DATA 157,64,3,232,200,196,251,208
7 DATA 245,169,0,157,64,3,32,253
8 DATA 174,32,139,176,166,13,240,3
9 DATA 76,72,178,165,69,141,64,3
■ DATA 165,70,208,2,169,32,141,65
11 DATA 3,169,61,141,66,3,166,251
12 DATA 232,232,232,160,0,185,64,3
13 DATA 153,0,2,200,202,16,246,165
14 DATA 122,133,254,165,123,133,255,169
15 DATA 0,133,122,169,2,133,123,32
16 DATA 121,165,32,115,0,32,237,167
17 DATA 165,254,133,122,165,255,133,123
18 DATA 96
20 EV=49152:CK=0:FOR A=EV TO EV+136
■ READ D:POKE A,D:CK=CK+D:NEXT A
40 IF CK<>17478 THEN PRINT "ERROR":STOP
50 INPUT "EQUATION ";E$
60 SYS EV,E$,A:PRINT "RESULT = ";A

READY.
```

Bank Account

Alastair Scott

This short program for the Amstrad CPC 6128 allows four Basic programs of less than 16k each to be stored in the extra banked Ram. To store ■ program load ■ and type *Put,x* where *x* is the bank number (0-3). To retrieve it type *Get,x*.

Avoid using addresses &4000 to &7FFF as they are used by the bank switching

```
100 'Basic programs in extra 64K
110 'by Alastair Scott
120 CLS:FOR a=&BE80 TO &BEE3
130 READ b$:POKE a,VAL("&"+b$)
140 NEXT:CALL &BE80
150 PRINT"Use |PUT,x and |GET,x."
160 DATA 01,89,BE,21,E0,BE,C3,D1,BC,91
170 DATA BE,C3,9B,BE,C3,BC,BE,50,55,D4
180 DATA 47,45,D4,00,3D,C0,DD,7E,00,C6
190 DATA 04,CD,5B,BD,21,70,01,11,00,40
200 DATA 01,90,3E,ED,B0,21,00,AE,11,90
210 DATA 7E,01,70,00,ED,B0,AF,C3,5B,BD
220 DATA 3D,C0,DD,7E,00,C6,04,CD,5B,BD
230 DATA 21,00,40,11,70,01,01,90,3E,ED
240 DATA B0,21,90,7E,11,00,AE,01,70,00
250 DATA ED,B0,AF,C3,5B,BD,00,00,00,00
```

Neatlist

Alastair Scott

With this Amstrad CPC routine you can emulate the BBC's *Listo* command. After running the listing use -

F1 turns *Neatlist* on. In this mode all statements separated by colons will be placed on separate lines and the textual parts of the program will be justified.

F2 returns to the normal *List* format.

F3 Lists ■ program

```
100 'Neatlist
110 'by Alastair Scott
120 MODE 1:MEMORY &99FF:f$=CHR$(13)
130 FOR a=&9A00 TO &9A7D
140 READ b$:POKE a,VAL("&"+b$)
150 NEXT
160 PRINT"f1-Neatlist on f2-Neatlist off f3-list."
170 KEY 129,"IF PEEK(&BB5A)=&CF THEN CALL&9A00"+f$
180 KEY 130,"IF PEEK(&BB5A)=&C3 THEN CALL&9A18"+f$
190 KEY 131,"CALL&BBFF:CALL&BB4E:LIST"+f$
200 DATA 2A,5B,BB,22,1A,9A,AF,32,41,9A,F5,3E
210 DATA C3,32,5A,BB,21,26,9A,22,5B,BB,F1,C9
220 DATA F5,21,00,00,22,5B,BB,3E,CF,32,5A,BB
230 DATA F1,C9,C5,D5,E5,32,73,9A,FE,22,20,0C
240 DATA 3A,41,9A,EE,FF,32,41,9A,3E,22,18,25
250 DATA FE,3A,20,21,06,00,CB,7B,20,1B,CD,18
260 DATA 9A,3E,0D,CD,5A,BB,3E,0A,CD,5A,BB,06
270 DATA 04,3E,20,CD,5A,BB,10,F9,CD,0A,9A,18
280 DATA 19,CD,18,9A,CD,78,BB,7C,FE,26,38,03
290 DATA 2C,26,05,CD,75,BB,3E,00,CD,5A,BB,CD
300 DATA 0A,9A,E1,D1,C1,C9,00,00,00,00,00,00
```

We want your programs!!

Yes, this is your chance to get rich and famous. Well, famous anyway, as *Popular Computing Weekly* is looking for contributions to the Programming pages.

What sort of thing are we looking for? You name it – anything original from games to utilities, applications and the like, written in Basic, machine code or anything else you can think of.

Programs for any computer will be considered, not just the old faithfuls (Spectrum, Amstrad, QL, Commodore, etc), so send those listings in. What we need is a working copy of the program on tape or disc, plus an accompanying article or documentation that you would anticipate going with the piece, normally not over 2000 words.

Alternatively, send in your short programs to the Bytes and Pieces page – what could be easier?

In return, we'll pay the princely sum of £25/page for the main programming pages and £10 for each Bytes & Pieces contribution we publish. Plus the fact that your name will be indelibly carved in the *Popular* Programming Hall of Fame till time immemorial. What more could any true programmer ask?

Just send your masterpieces in to **Duncan Evans, Technical Editor, Popular Computing Weekly, 12–13 Little Newport St, London WC2 7PP** and he'll assess them post haste.

with Kenn Garroch

Recording from Amstrad

John R Gigney, of Cold Norton, Chelmsford, writes:

Q I am an Amstrad owner, specifically the CPC464. In my spare time I do a little composing (music that is), using the disc version of Rainbird's *Music System*. The problem is that I want to record the music that I've written, so that my friends, relatives etc, can listen to it on cassette.

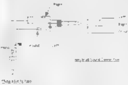
I have tried using the Amstrad's own ear socket, by connecting it to a cassette using an ex-Sinclair networking lead, connected between the ear socket on the Amstrad and the mic socket on the tape recorder. This method was somewhat successful, but at the loss of the alto part of the music and some of the bassline. This, I think, is mainly due to the fact that I am trying to connect a stereo socket to a mono socket.

Is it possible to connect the Amstrad CPC range machine via the EAR socket to mono cassette recorder and lose nothing? Or does there have to be an amplifier used before this can be done? (If there does then bang goes my chance of getting an ST.)

A Yes you can connect the Amstrad's ear socket directly to the mic socket of a tape recorder. Connect up the lead as in the diagram. You will need a 3·5mm stereo jack and whatever your tape connection plug is. In the picture I've assumed this to be a 3·5mm mono jack. All you need to do is connect the left and right channels together.

The reason it does not work when using a mono plug in the Amstrad can be seen when you look at the difference between the mono and stereo plug designs. Using a mono plug connects the right channel to ground thus losing it completely plus half the centre channel is put through the right for stereo so you lose that as well.

Sorry about the ST but perhaps you can get one anyway.



The missing MSX Link

Mark Morrison, of Pollock, Glasgow, writes:

Q I am writing to you to reply to Derek Patterson of Largs, Scotland, ■ let him and anyone else who is interested in upgrading their MSX 1 to MSX 2. I am a member of MSX Link and last month we had an article in the mag about the MA.ZO upgrade kit. It provides the following:

Nine screens; 128K Video Ram; RGB, composite video, and RF output; built in battery backed clock; 80 column display; full MSX ■ Basic commands; Ram disc facility.

The extra Basic commands give access to the new facilities. The only problem is that the MSX machine must be a 64K model, otherwise forget about upgrading.

The price of MA.ZO is £89.99 plus £5 p and p. If you wish to purchase one contact Karl Knaff UK, 68 Newhall Road, Leeds LS10 3RX.

If you would like to join MSX Link, get in touch with MSX Link, c/o David Webb, 11 Ayscough Avenue, Spalding, Lincs, 0775 3433.

A Thanks for the help, Mark. I hope this is of use to Derek Patterson and any other interested parties.

Connecting with Mannesman

Paul Drion, of Wincanton, Somerset, writes:

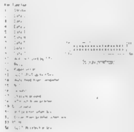
Q Do you know if I can use a Mannesman Tally Spirit 80 printer with my Atari ST? If so, can I purchase a suitable lead, or will I have to make one up myself?

A The Spirit ■ is a pretty standard Epson compatible and I presume yours has a Centronics interface. If so, you will be able to attach it to the Atari with the appropriate lead.

Most Atari suppliers stock a Centronics lead for the machine – it should cost you about £15–£20. If you can make one for less then you may as well.

All you need are two connectors. A 25-way D type plug (to match the picture), and a 36 amphenol plug an 18-way ribbon cable.

The connections you need to make are only those shown in the ST connection. The Centronics connection has quite a number of options that can be ignored. The ACK is not used by the ST, neither are the paper error, auto feed, init, error, and slot in.



Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2H 7PP.

Keeping tabs on Citizen

Stephen Kirk, of Morley, Leeds, writes:

Q I recently bought a Citizen IDP-560 printer (the small till roll beast) to use with my C64. One of the jobs I use the computer for is monthly sales figures. Previously I had been displaying the tabulated data on screen using the TAB(X) command to keep the columns tidy.

The 'on screen' TAB always counts from the first column irrespective of previous entries on that line.

However, I find that the printer tabulates from its last printer head position. I cannot use space as the individual table elements can vary from one to six figures in length. How do I get neatly aligned data columns using the printer?

A I am no expert on the Citizen IDP-560 so I can only give you a few ideas. A printer usually tabs, as you say, by receipt of a tab command (Ascii 9) moving the carriage to the next tab position. The TAB(X) command moves the screen cursor to the column number given by X measured from the start of the screen.

One way around this problem may be to insert carriage returns (Ascii 13s) before each tab sent to the printer. The carriage would then always tab from the start of the line.

continued on page 30 ▶

LAST
NJA

◀ continued from page 27

The only problem with this is that the printer may take a carriage return to mean both move to the start of the line, and then do a line feed. If this is the case with the Citizen then this method will not work. An alternative is to mimic the TAB (command on the C64, for the printer, ie,

```
1000 REM NUMBER TO BE PRINTED IS
IN N  X IS THE POSITION
1010 FOR I=1 TO X
1020 PRINT CHR$(32)
1030 NEXT
1040 PRINT N
1050 RETURN
```

Use GOSUB 1000 with X containing the position, and N, the number. This does left justify the numbers but not the decimal points. You will have to alter the subroutine to convert the number to characters, look for the dp and then position accordingly.

Another way of looking at the problem is to ignore the screen layout and format the printer output separately. To do this you will need to output the numbers in the sequence – they will be printed across the paper. Once this is done, print them out separated by tabs and they should all be lined up.

Hopefully one of the above possibilities will work.

Misunderstood errors

George M Stephen, of Blyth, Northumberland, writes:

Q Could you or anybody help me with a problem? I went to the local library and got out a book called *The Amazing Amstrad Omnibus* and decided to type in a game called Dominoes. After typing it in, I ran it and up on the screen came: Line Does Not Exist in 80.

So I typed in the line again which read: 80 GOSUB 1750:REM INITIALISE and the same thing happened again. So instead of running the tape back to the beginning I started it from where it stopped and on the screen came Unexpected Next in 420. So I typed in 420 NEXT J and as before, the same thing happened.

My computer is an Amstrad CPC464. I hope you or any other Amstrad user who has a copy of this book can help me out. The game is on page 235 and ends on 241.

A You seem to be misunderstanding the computer error messages somewhat. The 'line does not exist' error means that the program is looking for a line number after a GOTO or GOSUB command (the latter in this case).

After seeing this error, list the line in which it occurs and see which lines are trying to be found. Then list these, in this case LIST 1750. If it does not appear then you haven't typed it in, so crossref against the listing in the book.

By following the error messages, it is usually possible to take out most of the more obvious typing errors (everybody makes typing errors, it's what keyboards were invented for).

The second thing you seem to have misunderstood is that after typing in a program, you should save it. Saving a program puts everything you have typed in on to cassette. If you have only typed in part of the program, you can save that part but it won't run properly until all of the program is in the computer.

To attach the rest of the program, load the first part and continue entering lines from where you left off. Saving now saves more of the program and the process can be repeated until the save saves the whole program.

It may be that you have the time to type in the whole program in one go, in which case save it when you have finished. The next step is to get rid of the bugs (including typing errors) and then save it again as the final version. You cannot load the program in sections, unless they are being chained together but this is unlikely in this case.

The second error you found is due to there being a NEXT without a FOR. The computer expects every NEXT to have been preceded by a FOR and there should be an equal number of both in the program. FOR..NEXT loops can be nested, eg.

```
FOR T=1 TO 100
FOR S=2 TO 5
PRINT S,T
NEXT S
NEXT T
```

Note that the NEXT for the S comes before the NEXT for the T, ie. one loop is inside the other. You have probably missed out a line with FOR on it somewhere while typing it in. Look for FOR J= etc in the book listing and check the program to see if it is there.

It is possible that the publishers have printed an erroneous listing and although this is unlikely, it has been known to happen. If you have checked all the lines and the program is still chucking up errors, contact the publisher and ask whether there is an errata sheet available. If you get one, you may as well give it to the librarian who can attach a copy in the book for other readers to use.

Adding up the figures

L Saunders, of Tarporly, Cheshire, writes:

Q I have noticed that my computer, running Basic, only allows arithmetic with variables of limited numbers of digits. Is it possible to make the machine perform arithmetic functions on larger figures? If so, how is it done?

A Normally, integer numbers are stored inside the computer as 16 or 32 bits, depending on the version of Basic. To get larger numbers, the most efficient method is to resort to machine code. However, it is possible to use machine code techniques in Basic with decimal numbers. Using the methods described below, the only limit on the size of a number is the amount of memory available to store it.

A normal 16 bit variable is allowed values between ±32767. To get larger values, each integer is limited to a value between 0 and 999 to allow for carries. For the examples given here, I'll ignore negative representations.

Large numbers are created in arrays of numbers, each having a value from 0 to 999. So the first value array %(0) is 0–999. (The % symbol after a variable denotes a 16 bit integer), the second 1×1000 to 999×1000, the third up to 999×1000000 and so on. The first routine needed is a way of printing these on screen.

The Basic program shown doesn't use line numbers, it has labels instead. To convert it to line numbers, put one before each line and substitute the appropriate line numbers for the labels (a word followed by a colon, eg. *mprint* is a label). The *mprint* subroutine takes the 33 digit numbers in the array d% and prints it onto the screen by taking the right most digit and placing it into a string followed by the next right, etc.

Spaces are put into the string after every third digit to make the number readable. Next come the arithmetic functions *madd* and *msub*. The addition is performed in a similar way to written addition.

After each element of the array has been added to its corresponding element, a carry is generated from the fourth digit. This is then added into the next sum in c%. This process is performed for the whole array giving a multiple precision addition.

The subtraction is done in a similar way to the addition, the only difference is that the carry becomes a borrow. Again, it is the same as though it were being done on paper except that each element in the array is accessed as though it were one digit.

The only oddity of the subtract subroutine is that if the answer is negative, the numbers are switched and the *mi* variable set to one to indicate a negative result.

The final routine is a multiple precision multiply. Since two 16 digit decimal numbers produce a 32 digit number when multiplied, only 16 digits are allowed in the number doing the multiplying. The routine is split up into subsections since, 1) it is easier to understand and, 2) it was easier to write this way. When multiplying two numbers with the method sometimes known as long multiplication, the following takes place:

```
  ABCD
×   EF
----------
 E×ABCD×10
+F×ABCD
```

The tens are multiplied first with the answer being times ten, followed by the digits. These two results are added up to give the answer. So one of the numbers being multiplied shifts left (is times ten) and the other shifts right and the least significant digit (units) is used for the multiply.

Compunet to move in July

At the beginning of next month, Compunet will be switching over to a new mainframe. And, as Graham Edkins reports, it could be the start of great things.

"These changes will move Compunet from being a hugely popular C64 network to being a real force in the world of micro databases"

On July 1 Compunet should be in the middle of its great change to the new mainframe. Moving the complete database over to the new machine is not an easy job so they plan to take a 'copy' of [illegible] of the existing information, users' programs and text about a week before the move. This 'copy' will be the one that the new mainframe will open with after the conversion.

The new online code [illegible] written in C. Once any inevitable small bugs have been ironed out it will run a very much faster and improved service on the new mainframe which has been custom designed for the specific needs of this service. It runs on 68020 processors, each being dedicated to a single task such as getting a directory or showing [illegible] page, thus avoiding the slowness caused by users' commands having to wait their turn when a single processor handles all of the tasks. Compunet have described this as a multi-task, multi-threaded software design, having [illegible] VME architecture.

ERW7's contribution to the Compunet files

Apart from speed another advantage with this layout is that it has virtually limitless scope for growth. Initially the new system [illegible] double the capacity of the old but when more processing power [illegible] needed as more people join the network it can be increased by upgrading to, whatever is [illegible] the time, the latest processor [illegible] the 68000 series. Alternatively more of the same can be patched on.

Until now Compunet's problem has been accommodating all those who wished to join. Now they will be able to grow with demand and allow other micros online when they wish. Among the obvious contenders to break the mould of the dedicated single micro system are the Atari ST and the PC compatibles. Since the BBC micro was mooted as the first non-Commodore to be given access quite a long time has passed and this may not seem such an obvious choice now.

When you log-on to the new mainframe it will look the same as always, maintaining its directory structure, command duckshot, headings, alpha gotos and function key movements. In fact, you will not even have to download a new version [illegible] the access code.

Initially the long standing multi user game *MUD* will not be available but once everything [illegible] running smoothly the in-house written game, *Federation II*, will come on-line. There will also be another (as yet undisclosed) game available. The connect charge levied for weekday daytime use will be halved and certain users may have to use a different local access node to log-on.

These changes will move Compunet from being a hugely popular network for Commodore [illegible] owners to being a real force in the world of micro databases. Currently many people use it as a base for clubs or sigs (special interest groups).

An example of how these can be put to good use is in the communications directory. If you GOTO 'MICRON' you will arrive in an area where Bulletin Board sysops who use the Micron host software (myself included) have joined together informally to promote their boards and pass on information. There is a directory listing all of the boards running, their opening times and phone numbers, another directory holds the free downloadable access software and there are also areas for the users to upload questions or problems and for sysops to exchange help or information.

This Micron area is not run by any one user it simply maintains itself with the users uploaded frames keeping it alive, but without this area the sysops would be unlikely to be in contact with each other. They would most probably be competing with each other for users of their boards, but as it is they work together making their boards more widely used as a whole.

The Independent Commodore User Group (GOTO ICPUG) uses Compunet as one of its ways of communicating with both members and non-members. In ICPUG's directory there is a sub-directory for non-members which has free programs, information and membership details, while in the Closed User Group (CUG) which members can enter, it has most of its library of Commodore 64/128 public domain programs available to download, group details, help areas and even another CUG for committee members.

For most users though, it is the vast array of free programs which attracts them to Compunet. The Hall of Fame which is an area used by Compunet to hold the most outstanding of these programs has a new directory especially for free games (GOTO FREEBY). As this is a recent addition it is currently smaller than the more established parts of The Hall of Fame but you will find *Freak-out* by Master *Cybertrap* by ID2, *A Load of Balls* by Hagar and [illegible] couple from Ubic including his *Nostalgia Trip* program which is [illegible] nice simple space invader game the like of which are sadly scarce in these days of highly sophisticated games software.

RS16, who has a program in the Freeby directory, also has his own area in the Jungle. GOTO 'ROS' and you will be rewarded with a selection of free games, demos and utilities which include an 80 column terminal emulation program, an assembler and a game called *Omniopoly* as well as a demo which [illegible], very honestly, called *Nicked Music*.

THE SENSIBLE WAY TO EDIT ON THE ST

Mark Jenkins reviews the Soundbits Voice Master to use when editing with an Atari ST.

Over the last few weeks I've mentioned the usefulness of computer-based editing packages several times. The main reason for their development has been the cost-cutting measures introduced by synth manufacturers – which largely take the form of leaving the knobs off synthesisers.

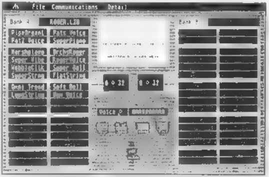
Anyone who owns a Casio CZ101, a Yamaha DX100, or a Roland Alpha Juno synth will realise that editing sounds using a single control - the data entry slider on the Yamaha, the value buttons on the Casio or the Alpha Dial on the Roland - can be an arduous task. To their credit, Roland do supply optional programmers - control panels with a complete set of parameter knobs - for most of their synths, but these units cost a couple of hundred pounds and have no equivalent for the Casio or Yamaha catalogues.

Sound editing using a micro makes sense, particularly if you're already using a micro as a sequencer. It can also help you to build up a library of sounds which would otherwise have to be laboriously saved to tape or to expensive cartridges. In most cases it will also allow you to name your sounds, which you can't do on the Casio, for instance.

The latest synths to be aided by a micro editing package are the Roland Alpha Junos – the Alpha Juno 1 is a compact six-note polyphonic analog design and the Alpha Juno 2 has a longer keyboard and features velocity and pressure sensitivity. The new package, the latest in the Voice Master series, is on the Soundbits label for the Atari ST and is being distributed by Syndromic Music, at the same time they've released an editor for the Yamaha TX81Z which is a rack-mounting, eight-note multi-timbral Fm synth. Unlike the earlier FB-01 module, the TX81Z can be edited, but its handful of controls don't make this a straightforward task.

Soundbits is also about to market an editor for the Roland D50. This is a rather more upmarket synth costing £1400 or so which works using a system called Linear Arithmetic Synthesis. In practice this means that the attack phase of each sound is digitally sampled, with 100 different samples available, but the sustain portion of the sound is synthesised. The result is an instrument which has all the power and conviction of a sampler but all the editing ability and performance control of a conventional synth.

The editing routines for LA Synthesis sounds are pretty complex and involve a complex set of controls (on an optional programmer) plus a joystick on the synth itself, which varies the proportion of various components of the sound. Clearly an editor is going to be pretty useful here - the synth itself is causing enormous waves and everybody who hears one seems to want to buy one!



Soundbits Voice Master for Alpha Juno ½ and Atari ST: the Library Page.

Back, though, to the Alpha Juno editor which opens with a straightforward table of sound parameters including the synth's waveform, pitch envelope, LFO and Chorus settings. The sound name is displayed at the top of the screen and this is shown as "Undefined" until you load a sound either from the built-in library or from the synth itself.

The File option allows you to save individual sounds or whole banks of sounds to disc, while the Juno option allows you to decide whether you're dealing with a single sound or whole banks of sounds. You can Print out a parameter list or go to the Graph option to display a particular envelope.

The envelope display is a simple five-stage chart of level against time, and you can use the mouse to drag small red boxes marking the end of each stage to new settings. On the review copy it was a little difficult to get hold of these boxes but we understand this will be tidied up on production versions. Certainly it's handy to be able to set an envelope without typing in a lot of individual parameter settings.

The Library option offers two banks, marked A and B, each comprising 64 voices, of which 32 are listed at any one time. The built-in library includes such efforts as Wobbleclick, LongString, Softbell and so on, and these of course are a valuable bonus over and above the sounds which come provided with the synth. If you haven't heard the Alpha Juno, you'll be pleased to learn that it's quite a versatile machine, capable of fairly rich, fat analog sounds and also some cleaner digital effects thanks to a large variety of waveforms and a useful chorus.

The final sections of the Editor, labelled Detail, let you see the parameters for the DCO, VCA and VCF in greater depth. Waveforms are displayed in icon form and you can enter new values for the aftertouch depth, noise level and other parameters. There's also a clever Blend function which allows you to create an average of two sounds; you can set the Blend control to any point between two and produce a string sound with a touch of the percussion of a vibes setting, or a violin with some of the random elements of a totally abstract sound.

The Test routine allows you to sound any one of four different chords or a constant note, should you be editing a keyboardless Alpha Juno module (or indeed be using your computer on one side of the studio while the synth is on the other).

Overall the Soundbits Alpha Juno editor is everything any owner of the synth could want, and clearly a good alternative to buying the expensive programmer until should you already have an ST and be interested in building up a large library of sounds (and who isn't?).

In the next few weeks we'll be looking at more software from the Soundbits range.

If you have any queries or tips for this column, please write to Mark Jenkins at *Popular Computing Weekly*, 12–13 Little Newport Street, London WC2H 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.

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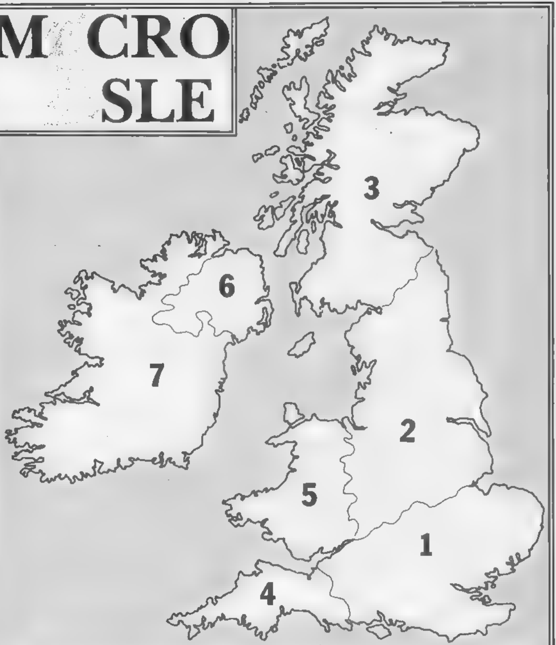

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NEW RELEASES

Your complete guide to all the software released this week

Amstrad CPCs

Program *Trio* **Type** Compilation **Price** £9.95 tape, £14.95 disc **Supplier** Elite, Anchor House, Anchor Road Aldridge, Walsall, West Midlands.

See panel for comment.

Program *Slap Fight* **Type** Arcade **Price** £8.95 **Supplier** Imagine Software, 6 Central Street, Manchester M2 5NS.

Program *Samurai Trilogy* **Type** Martial arts **Price** £9.99 tape, £14.99 disc **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield

Program *Spaced Out* **Type** Strategy/board style game **Price** £1.99 **Supplier** Firebird, 74 New Oxford Street, London WC1A 1PS

Move across a grid from the bottom left corner to top right according [illegible] throws [illegible] a dice. The aim is to land on 'nasties' squares and avoid hav[illegible] the nasties box you in.

Program *Ultima Ratio* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 74 New Oxford Street, London WC1A 1PS

A shoot 'em up is a shoot 'em up is a shoot 'em up.

Program *Dawnssley* **Type** Arcade **Price** Unavailable **Supplier** Top Ten Hits, Mil 12, Chiltern Enterprise

continued on page 42 ▶

Day out at Silverstone

How does the idea [illegible] an all-expenses paid day out at Silverstone grab you? Be there for the test driving [illegible] the Mastertronic sponsored C sports car – a Tiga British chassis car with Volvo twin turbo 2.1 litre engine – driven by Andrew Ratcliffe, one of the Mastertronic team entered for the recent Le Mans 24 hour race.

Three winners [illegible] our ludicrously easy to enter competition will win the Silverstone trip, which will take place one day on the week beginning July [illegible] (day to be arranged between the winners and Mastertronic Software). Five runners up will get a Mastertronic race team T-shirt (one size fits all).

How [illegible] enter

Couldn't be simpler. Just answer the following three questions correctly and send them in, with the coupon below, to Silverstone Competition, *Popular Computing Weekly*, 12–13 Little Newport Street, London WC2H 7PP.

1) Which team won the 1987 Le Mans 24 hour race held on June 13–14?

[illegible] Which driver on the winning team was making his 17th competitive appearance in the 1987 Le Mans race?

3) Which Mastertronic game, with a motor racing theme, [illegible]s just chalked up sales of 500,000 units?

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Three correct entries will be selected [illegible] random from all entries received to determine the three winners. A further five selected at random will win runners-up T-shirts.

The closing date is Friday July 3, (ie. you have only one week [illegible] get your entries in). Winners will be notified by Mastertronic by phone on that day to arrange their visit. Winners and runners up names will be published in *Popular Computing Weekly*, July 10.

Only one entry per person, please, and the judges' decision is final.

Hall of Fame

Program *Faery Tale* **Price** £49.95 **Type** Arcade Adventure **Supplier** Haba Marketing, Lonbridge Delta, Pier Road, North Feltham Trading Estate, Middx TW14 0TT

When the Amiga first arrived, we had the promise of a new generation of games but the early efforts (not surprisingly) failed to deliver.

But while many software companies have been making a lot of noise and promising the earth little-known Haba Marketing has quietly slipped in a scorcher.

The program is *Faery Tale*, produced by MicroIllusions and it's a knockout role-playing game that really takes the genre into a new age.

On the face of it, the game suffers a near-terminal dose of twee. Apart from the title there are the three main characters Julian, Phillip and Kevin. In a country where the average Christian names include Hank, Mort and JR, Julian, Phillip and Kevin may appear exotic and heroic.

In Britain they sound like the juniors in a stockbroker's office.

But this is a tale of stirring heroism, with much wielding of swords and maces, casting of magic, and intelligent pursuit of clues. The scenario holds no surprises: an evil wizard has taken over your country, abducted the king's daughter and more or less throughly killed off the tourist trade.

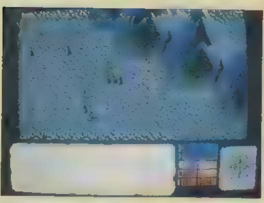
It's up to you to rescue the princess, sort out the necromancer and put things right.

You start as Julian, and if the elder brother pops his clogs, Phillip vows to take to up the quest, and so on until you're reduced to Kevin. If you end up as Kevin, you may as well restart the game because - although Kevin is a really nice boy - he's barely able to cross the road without being run over by a passing horse and cart.

You start off with a dagger and a handful of gold pieces. By dint of courage and copious blood-letting you can acquire better weapons, more gold, and magic items. Robbing the dead may not be gracious but these are hard times.

The magic items are handy: there are bits and pieces that will give you a bird's eyes view of the surrounding terrain - crucial in many cases. Jade Skulls that act like Medieval smart bombs, and other tokens that will suspend time, give you infra-red vision, and transport you long distances.

So you proceed, knocking off as many of the enemy as possible, talking to helpful characters who'll give you useful hints, building up your fighting skills and vitality which are essential for a long life in these parts.



On your travels you'll find special items, and friendly creatures who'll help you get to inaccessible places like islands and mountain fortresses.

The game universe is enormous and can literally take hours of walking to explore one area. There are lakes, rivers and impassable mountain ranges, burning deserts, volcanic lava flows, dense forests. Lesser wooded areas can be entered but progress is slow. The great bog can be navigated, but don't drown in the especially marshy bits.

The best areas are underground: the enormous and confusing dragon's cave, the labyrinth of Hemsath's Tomb.

So far, so brilliant. But what really puts *Faery Tale* a million miles ahead of every similar game is the presentation.

No text-based adventure this. No spot graphics, or simple 3D mazes.

Faery Tale is a visual treat in colourful and solid three-dimensional graphics. Superb support is lent by the accompanying music and sound effects.

When you fight, all the characters are animated, there's the ring of steel on steel, and the groans and gasps of wounded creatures.

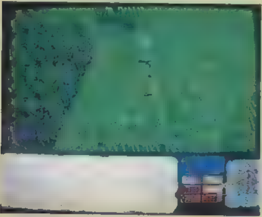
As night falls the colours fade out appropriately until at midnight you can barely see a thing. No other computer could manage this kind of display.

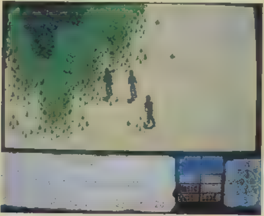
The animation is splendid as Julian wanders about the countryside, and the monsters are equally well drawn, especially the frightening black-robed priests who float ethereally through solid objects. They're particularly nightmarish in the caverns where they have a habit of popping up out of rock walls.

Faery Tale is a programming tour-de-force, superbly designed and executed. It will take you weeks to explore the game, and who knows how long to beat it.

Not only a worthy entrant to the Hall of Fame, but easily one of my all-time top five computer games.

Peter Worlock





◀ continued from page 40

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Program *Catch 23* **Type** Arcade Adventure **Price** £8.95 tape, £13 95 disc **Supplier** Martech Martech House. Bay Terrace. Pevensey Bay East Sussex. BN24 6EE

See Spectrum for comment

Atari ST

Program *Hardball* **Type** Baseball simulation **Price** £24 99 **Supplier** US Gold Units 2 and 3. Holford Way. Holford. Birmingham B6 7AX

Poor instruction booklet, suspect mouse compatibility. what else can we say?

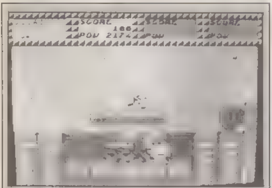
Well the graphics are fabulous Awesome Particularly ■ the close up pitching screens And the animation on the whole is very smooth and impressive although characters intermittently disappear in the whole field view when you're making your runs This could be deliberate but the documentation is so sparse it's impossible to tell

Get your ST hooked up ■ a joystick (it claims to be mouse compatible. but our mouse didn't like it very much) and make those home runs

Atari XL/XE

Program *Aztec Challenge* **Type** Arcade **Price** Unavailable **Supplier** Top Ten Mil 12 Chiltern Enterprise Centre. Station Road Theale. Berkshire RG7 4AA

Program *Universal Hero* **Type** Arcade **Price** £2 99 **Supplier** Mastertronic 8–10 Paul Street. London EC2H 3JY



Quartet could have been a great game, but only manages to scrape a "passable" because not enough thought has gone into either the graphics or the game play, on the Commodore 64 version at least. Converted from the Sega multi-player coin-op game, some (inevitable) slimming down has been implemented.

Perhaps meant to appeal to the same audience who enjoyed *Gauntlet*, the game offers the same opportunities to move through scenery with very little to do except kill everything that moves. In this case, the scenery is the system of caverns, platforms and installations comprising a space colony, and the baddies are scrungy mutant terrorists.

You choose which character you want to play according to his or her (yes, 'her'; there's a female character as well) fighting abilities: speed, jumping, weapons handling and so on. The rest is just a matter of fighting through each level, zapping the guardian robot at the end and collecting the key through to the next section. Easy. I finished four levels without even realising that I was holding the joystick – though there are 22 in all.

While little bonuses like jetpacks, smart bombs, shields and so on add a little incentive to the action, on the whole the drab design and monotonous gameplay don't do much to involve the player. The music is fine, but continuous – although I do know people who buy software according to whether the game music is any good. Perhaps *Quartet* would suit them; at £9.99, it didn't do much for me.

Chris Jenkins

Program *Invasion* **Type** Arcade **Price** £1 99 **Supplier** Bulldog/Mastertronic 8–10 Paul Street London EC2H 3JY

BBC ■

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Includes its own maze maps or you can start from scratch Ditto for the icons there's a library or you can go ahead and make up your own Once done you can go ahead and play it

Spectrum Commodore and Amstrad versions in the pipeline

Program *Squeakaliser* **Type** Arcade **Price** £2.99 **Supplier** Bug Byte Victory House. Leicester Place London WC2H 7NB

Commodore Amiga

Program *Swooper* **Type** Arcade **Price** £19.95 **Supplier** Diamond Games/Robtek. Unit 4. Isleworth Business Complex St Johns Road. Isleworth Middlesex

Dull arcade game. but the sound effects are something else Once you've got going into the game the sampled explosions sound like something out ■ *Apocalypse Now*

Program *Hollywood Poker* **Type** Card game simulation **Price** £19.95 **Supplier** Diamond Games/Robtek, Unit 4. Isleworth Business Complex, St Johns Road Isleworth, Middlesex

Excellent music good digitised graphics, very poor game of poker You pays your money

Program *Demolition* **Type** Arcade **Price** £9 95 **Supplier** Anco 4 Westgate House. Spital Street, Dartford, Kent

Break out played against an independently top down scrolling background Clever

Program *Phalanx* **Type** Arcade **Price** £9 95 **Supplier** Anco. Westgate House. Spital Street Dartford, Kent

Written by Kingsoft. the team which ■ currently developing ST titles for Gremlin Graphics *Phalanx* ■ an entirely adequate shoot 'em up

The music is great the graphics not so hot

Program *Space Battle* **Type** Arcade **Price** £9 95 **Supplier** Anco. 4 Westgate House Spital Street, Dartford, Kent

Asteroids clone However with all these Anco titles ■ under a tenner, you can afford ■ be impulsive

Commodore 16 Plus 4

Program *Xadium* **Type** Arcade **Price** £1.99 **Supplier** Mastertronic, 8–10 Paul Street London EC2H 3JY

Commodore 64/128

Program *Trio* **Type** Compilation **Price** £9 95 tape £14.95 disc **Supplier** Elite Anchor House, Anchor Road Aldridge. Walsall, West Midlands

See panel for comment.

Program *Doc the Destroyer* **Type** Combat/arcade **Price** £8.95 **Supplier** Melbourne House, 8–10 Paul Street. London EC2H 3JY.

continued on page 44 ▶

Summer Madness

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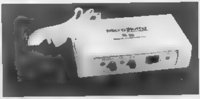

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NEW RELEASES

◀ continued from page 42

Program *Kikstart II* **Type** Arcade **Price** £1 99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2H 3JY

Program *Hyperforce* **Type** Arcade **Price** £1 99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2H 3JY

Program *Destructo* **Type** Arcade **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul Street London EC2H 3JY

Program *How to Get the Most Out of Your Computer* **Type** Basic utility/Art package **Price** £9.99 **Supplier** The Power House, 9 Kings Yard, Carpenters Road, London E15

The Power House used to be called Alpha Omega and produced budget arcade titles which left the world singularly unlit

The Power House is still producing budget arcade titles but this is a departure from the norm Though you would not guess it from the titles this is a graphics and adventure writing package

It comes on two tapes and is extremely good value for money although at the price, do not expect the *Advanced Art Studio* and *Quill* all rolled into one

Imported from US software house Novelsoft

Program *Golden Oldies* **Type** Compilation **Price** £9 95 **Supplier** Diamond Games/Robtek Unit 4, Isleworth Business Complex St Johns Road Isleworth Middlesex

Golden Oldies it says at the top Twenty New Games it says at the bottom

Apparently this means 20 not very new games but previously unreleased Anyway the 20 nclude *Lawn Tennis* (very green) *Alien Attack* (enough said) *Championship Backgammon, KO Boxing, Othello, Ten Pin Bowling, Astronaut Battle* and *Yahtzee*

What you might call a mixed bag If you're a professional boxer from outer space who'll be taking their backgammon set to Wimbledon this week you'll love this

Program *Quartet* **Type** Arcade **Price** £9 99 tape £14 99 disc **Supplier** Activision 23 Pond Street, London NW3

See panel for comment

Program *The Last Ninja* **Type** Martial arts **Price** £9 99 tape, £14 99 disc **Supplier** System 3/Activision, 23 Pond Street London NW3 4UE

Program *Aztec Challenge* **Type** Arcade **Price** unavailable **Supplier** Top Ten Mil 12, Chiltern Enterprise Centre, Station Road Theale Berkshire RG7 4AA

Program *Spellseeker* **Type** Arcade Adventure **Price** £2.99 **Supplier** Bug Byte Victory House, Leicester Place London WC2H 7NB

Program *Snap Dragon* **Type** Martial arts **Price** £8 95 tape £12 95 disc **Supplier** Bubble Bus, 87 High Street Tonbridge, Kent TN9 1RX

Program *Denarius* **Type** Arcade **Price** £1 99 **Supplier** Firebird, 74 New Oxford Street, London WC1A 1PS

If you regard three not-quite-good-enough-for-full-price-but-better-than-budget games at £9.99 to be a bargain, then Trio . . . is one.

A mixed bag of sequels, arcade conversions and workmanlike potboilers, *Trio* springs from the Elite label. While the Spectrum and Amstrad versions contain the three games reviewed here, the CBM 64 has the strange-looking *Cataball* instead of *3DC*.

Airwolf 2 is, quel surprise, a sequel to *Airwolf*. This virtually impossible arcade extravaganza was a big hit for Elite, but with the demise of the TV series I guess the sequel didn't look like such a good prospect.

In fact it's a case of "Stringfellow Hawke in Space" – a sort of helicopter *Nemesis*, with alien space ships, gun emplacements and missiles trying to zap you as you penetrate their mothership. As per usual, extra weaponry can be gained by picking up power capsules. Not bad, but one of many *Nemesis* clones for the Spectrum, of which Hewson's *Zynaps* is probably the best.

Great Gurianos is an oddity, a coin-op conversion featuring an armoured warrior moving right to left through a holocaust of attribute clashes. You have a shield which can be held high, middle or low, and a sword which can slash within the same parameters. Hitting certain flying boogies gives you temporary invulnerability, strengthens your armour or restores your shield. Amusing in a cartoony sort of way.

3DC (Three-d sea) is an Ultimate-style diagonal perspective arcade adventure set in an undersea world, where your task is to collect the bits required to build a submarine. Ink-squirting octopi and wriggly gels add to the aquatic japes.

What can I say? All pretty good, no classics, but a few hours of much appreciated entertainment. Good for birthdays.

Chris Jenkins

IBM PC and compatibles

Program *Hardball* **Type** Baseball simulation **Price** £19.99 **Supplier** US Gold Units 2 and 3, Holford Way Holford, Birmingham B6 7AX

See Atari [illegible] for comment

MSX

Program *Voidrunner* **Type** Arcade **Price** £2 99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2H 3JY

Program *Flash Gordon* **Type** Arcade **Price** £2 99 **Supplier** Mastertronic, 8-10 Paul Street London EC2H 3JY

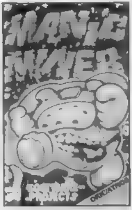
Program *Storm Bringer* **Type** Arcade Adventure **Price** £2.99 **Supplier** Mastertronic 8-10 Paul Street London EC2H 3JY

Oric 1/Atmos

Program *Xenon III* **Type** Arcade **Price** [illegible] 50 **Supplier** IJK Software, Unit 3c, Moorfields, Moor Park Avenue, Bispham, Blackpool, Lancs.

Program *Maze Rally* (48K only) **Type** Arcade **Price** £6 95 **Supplier** FGC Distribution, [illegible] Meadowcroft, Euxton Chorley, Lancs PR7 6BU

Program *Manic Miner* **Type** Arcade Adventure **Price** £7 95 **Supplier** Software Projects, Bearbrand Complex, Allerton Road, Woolton, Liverpool L25 7SF



Spectrum

Program *Catch 23* **Type** Arcade Adventure **Price** £7 95 **Supplier** Martech, Martech House, Bay Terrace, Pevensey Bay, East Sussex BN24 6EE

Martech's contribution to the 'megagame genre *Catch 23* has millions of mapable locations, and involves you in the sort of quest (find CK23 military test site, blow up island overrun by the enemy) in which every type of computer [illegible]mesplay will be needed at some point (apart from pixies and Brian Jacks)

So there's adventure style location finding and exploring arcade style blasting the baddies plus strategy style read the dossier on the 16 kidnapped scientists, and work out which one [illegible] hidden where so that you can rescue them

A formidable package, presented - on the Spectrum - in black and white wire frame graphics The baddies look dead neat

Program *Rubicon* **Type** Arcade **Price** £2.99 **Supplier** Bug Byte Victory House, Leicester Place, London WC2H 7NB

Program *Inspector Flukeit* **Type** Arcade Adventure **Price** unavailable **Supplier** Top Ten Hits Mil 12 Chiltern Enterprise Centre Station Road Theale Berkshire RG7 4AA

Program *Storm Bringer* **Type** Arcade Adventure **Price** £2.99 **Supplier** Mastertronic 8–10 Paul Street, London EC2H 3JY

Program *How to Get the Most Out of Your Computer* **Type** Basic utility. Art package **Price** £9.99 **Supplier** The Power House 9 Kings Yard Carpenters Road London E15

See Commodore 64 for comment

Program *Spaced out* **Type** Arcade **Price** £1 99 **Supplier** Firebird 74 New Oxford Street London WC1A 1PS

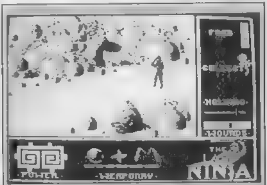
See Amstrad for comment

Program *Galletron* **Type** Arcade **Price** £1 99 **Supplier** Bulldog/Mastertronic 8-10 Paul Street, London EC2H 3JY

Program *Trio* **Type** Compilation **Price** £9.95 **Supplier** Elite Anchor House Anchor Road Aldridge Walsall West Midlands

See panel for comment

Program *Doc the Destroyer* **Type** Combat/Arcade **Price** £8.95 **Supplier** Melbourne House, 8–10 Paul Street London EC2H 3JY



If looks were everything, *The Last Ninja* would definitely qualify as one of the most impressive Commodore 64 games of recent months. It would also prove, along with Palace's *Barbarian*, that there's life in the old chop 'n' slash genre yet. After all, it certainly isn't the first Ninja by a mile.

In this case, the added thrill consists of the multi-screen, arcade adventure element which so conspicuously failed to make *Fist II* take off, refined to a much higher level.

Your Ninja warrior travels lonely roads through jewelled gardens, past exotic temples and through desolate dungeons. The backgrounds are sumptuously detailed, and the screen design – with the action seen from diagonal perspective in the main part of the screen, and icons indicating strength, possessions, enemy strength and so on, on the right and bottom – making *The Last Ninja* tremendously attractive to look at.

While the animation and sound effects are admirably smooth, it's the control aspect which lets the game down. Depending on which weapons you have found and picked up along the way, there are dozens of moves available, and I, 13th Dan on *Way of the Exploding Fist*, master of Karate and chief head-chopper, couldn't persuade my Ninja to make the right move twice in a row.

When I wanted to chop, he jumped; when I wanted to run, he ducked; when I wanted to fight, he just stood and bled.

Despite difficulties in getting to grips with the game, this massive two cassettes full must be worth checking out. At £9.99, if you can master it, it may well be worth the extra effort. And the wait.

Chris Jenkins

CHARTS

Top Twenty

1	(1)	Barbarian	**Palace**
2	(3)	BMX Simulator	**Code Masters**
3	(2)	Milk Race	**Mastertronic**
4	(6)	Football Manager	**Addictive**
5	(5)	Paperboy	**Elite**
6	(–)	I Ball	**Firebird**
7	(4)	Four Great Games	**Micro Value**
8	(10)	Six Pack	**Hot Pak**
9	(9)	Army Moves	**Imagine**
10	(7)	Enduro Racer	**Activision**
11	(8)	Feud	**Bulldog**
12	(11)	Gauntlet	**US Gold**
13	(13)	Olympic Spectacular	**Alternative**
14	(18)	Stormbringer	**Mastertronic**
15	(16)	Leaderboard	**Access – US Gold**
16	(12)	Ghost Hunters	**Code Masters**
17	(14)	Five Star Games 2	**Beau Jolly**
18	(–)	Red Arrows	**Alternative**
19	(17)	Konami Coin-Op Hits	**Imagine**
20	(–)	Deeper Dungeons	**US Gold**

All figures compiled by Gallup/Microscope

The never-ending march of technology

No matter how technologically advanced a machine is thrown in the general direction of the public, they always conquer it. A machine may be released to an awe-inspired public, enthusing about its virtues, but three days later there are gurus who have been there and back twice.

When the late ZX80 first entered the public arena, one could almost hear the gasp coming from the line of a thousand exalted people. Although no-one seemed to understand the meaning of 1K, it didn't matter, after all, whatever it is it must be good! So people rushed off their £99.99 with romantic ideas of computerised homes and better lives. What they received however, was the beginning of a new era in computer technology.

After some time, other computers from different manufacturers began to spring up. These machines possessed unimaginable powers such as colour displays and 16K memories; now these really must make the tea. Programmers everywhere were freed of prime number calculators, guess the number games and 'out of memory' errors. This was the time when 64K was so much memory no-one could ever hope to fill it, disc drives were the preserve of the Americans and those few British who could afford such a luxury. A luxury it certainly was, especially if you'd just paid the best part of £400.00 for the computer and tape deck.

Surprisingly, the computer market was allowed to grow stagnant after this point, a case of the companies resting on their laurels. Sure, new computers were produced, but none of them really were *new*. Consequently, computer sales dropped. No-one is going to buy a product similar to one they have, if it does not offer something substantially more. This made it possible for incredibly large software bases to build up for certain machines, something which is extremely difficult to break. Any new micro after this point had to be revolutionary to break into the market.

These revolutionary machines have now arrived, in the form of 16-bit systems. Based on the Motorola MC68000 chip, they have excellent processing power, brilliant graphics and true business capabilities, although it is now widely accepted that computers aren't much good at making tea.

So the cycle has started again. Machines are more powerful and have larger memories. Although strangely enough, I'm still all for even more memory, with legitimate reasons this time. As machines grow in power, it is inevitable that memory is used up in an equally consistent manner. If it's not, then you're not using the machine to full advantage.

In six or seven years, we come from a machine which had barely enough memory to write a calculator program, to machines which copy the latest arcade game down to the last detail and look after your business affairs with exceptional competence.

This can only be said to be wondrous, and all credit where it is due, but what of the future? We'll be seeing colour graphics of true photographic quality, synthesisers for sound chips and possibly even voice synthesisers that sound real. Memories will naturally increase, and soon we'll be talking in higher denominators than megabytes.

Perhaps in a few years time, I'll be upgrading because 15 cigabytes 'just isn't enough'. Between you and me, I think that is a certainty.

P Rowley

Puzzle No 263

I have a standard pack of playing cards, comprising of the 52 cards plus one joker. Taking these cards, I propose to ask a friend to try an experiment.

He is first to decide on any number in the range 1 to 99 inclusive. He is then to transfer this number of cards, one at a time, from the top of the pack to the bottom. He is then to discard the next card.

Using the same number that he has already decided upon, he is to repeat the procedure until only one card remains. For example, if he chose the number 15, he would transfer 15 cards, discard the next (16th) card, and then transfer another 15 cards, discard the next, and so on.

Of course, this might entail a rather lengthy process, especially if the number chosen was on the large side!

Now, you may recall that there are fifty-three cards, as there is one joker amongst them. I want to ensure that when 52 cards have been discarded by this process of elimination, the final card that is left is **not** the joker. Of course, I have no way of knowing in advance what number my friend is going to choose. However, there are a number of positions in the original deck that I can contrive to place the joker so that I can achieve this end.

Can you say what these positions are (counting from the top of the deck)?

Solution to Puzzle No 258

After the example given, the next three sets of 'nearly' cubes are:

(20*21*22) + (54*55*56) = (55*56*57)
(30*31*32) + (55*56*57) = (58*59*60)
and (39*40*41) + (70*71*72) = (74*75*76)

The program generates pairs of 'nearly' cubes in sequence (lines 20 and 40). The combined volume of these is found at line 50, and this value is then tested to determine if it is a possible value for the volume of a larger 'nearly' cube. This is done at lines 60 to 100, starting with an initial value equal to the size of the larger of the two smaller 'nearly' cubes (line 60).

Winner of Puzzle 258

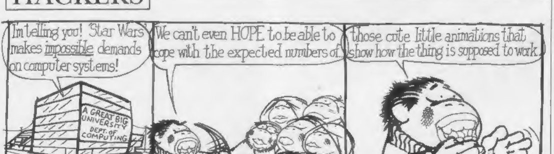
This week's winner is Paul Bylord, of Tamworth, Staffs, who will receive £10.

Rules

The closing date for Puzzle 262 is July 15.

```
 10 A=2:TALLY=0
 20 AV=A*(A+1)*(A+2)
 30 FOR B=1 TO A-1
 40 BV=B*(B+1)*(B+2)
 50 TV=AV+BV
 60 N=A
 70 NV=N*(N+1)*(N+2)
 80 IF NV=TV THEN PRINT A,B,N:TALLY=
TALLY+1
 90 IF TALLY=4 THEN STOP
100 IF NV<TV THEN N=N+1:GOTO 70
110 NEXT B
120 A=A+1:GOTO 20
>
```

HACKERS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